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VOLUME, 127, NO. 11 SEPTEMBER 9, 1948

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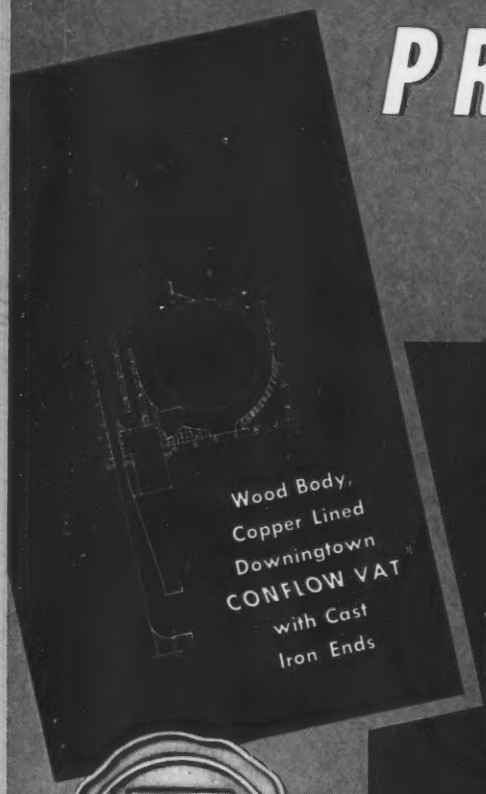
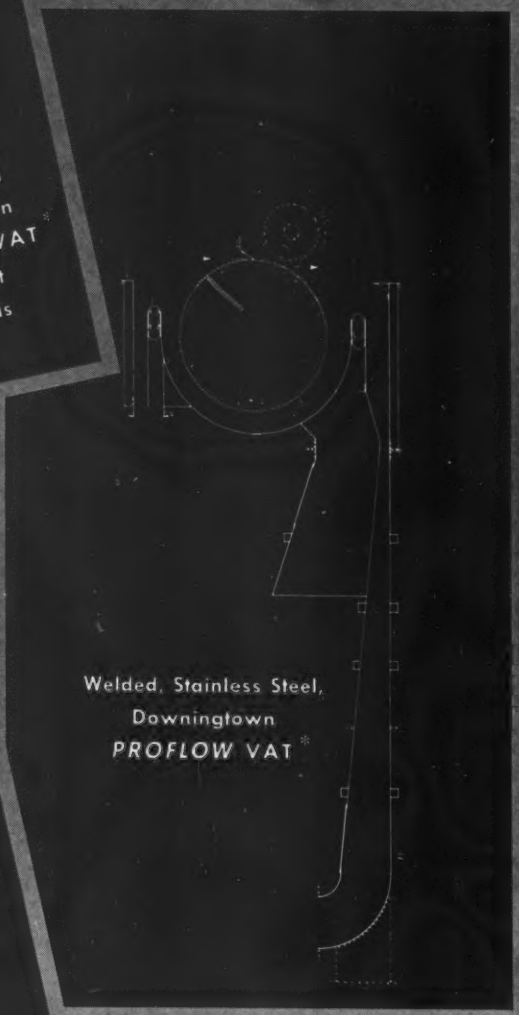
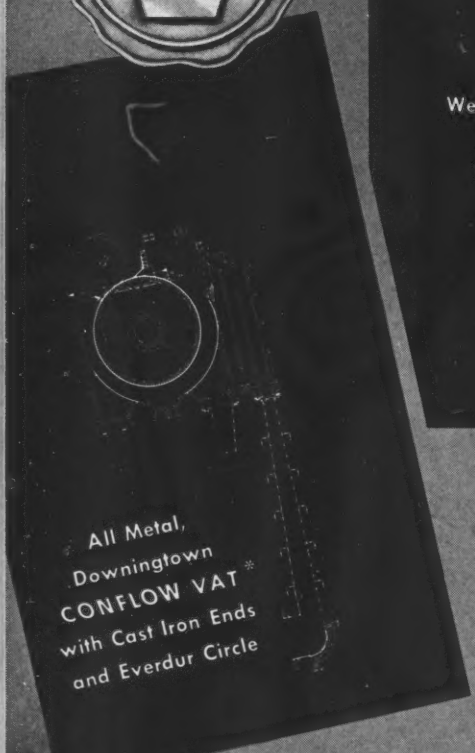


Wood Body, Copper Lined Downingtown CONFLOW VAT* with Cast Iron Ends



Welded, Stainless Steel, Downingtown *PROFLOW* VAT*

Welded, Stainless Steel, Downingtown CONFLOW VAT with Suction Slice



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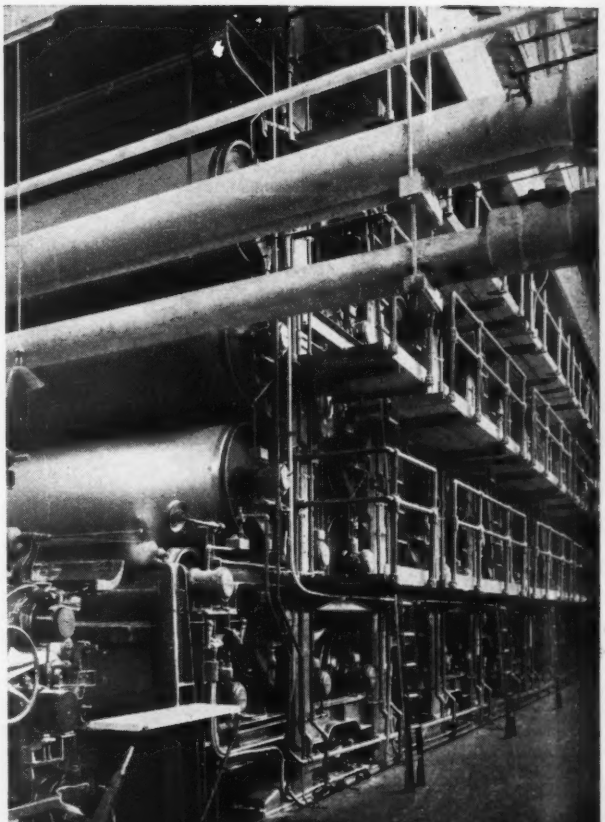

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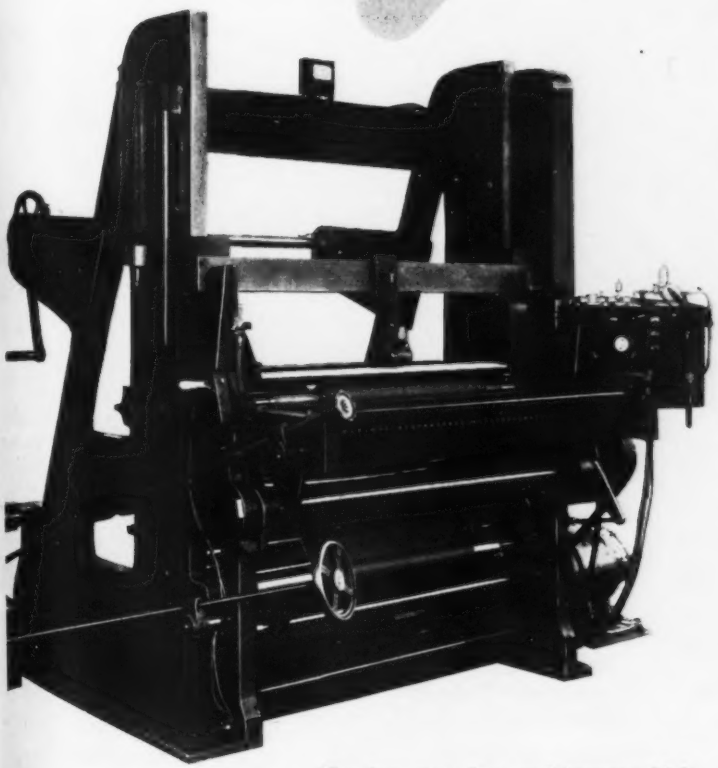

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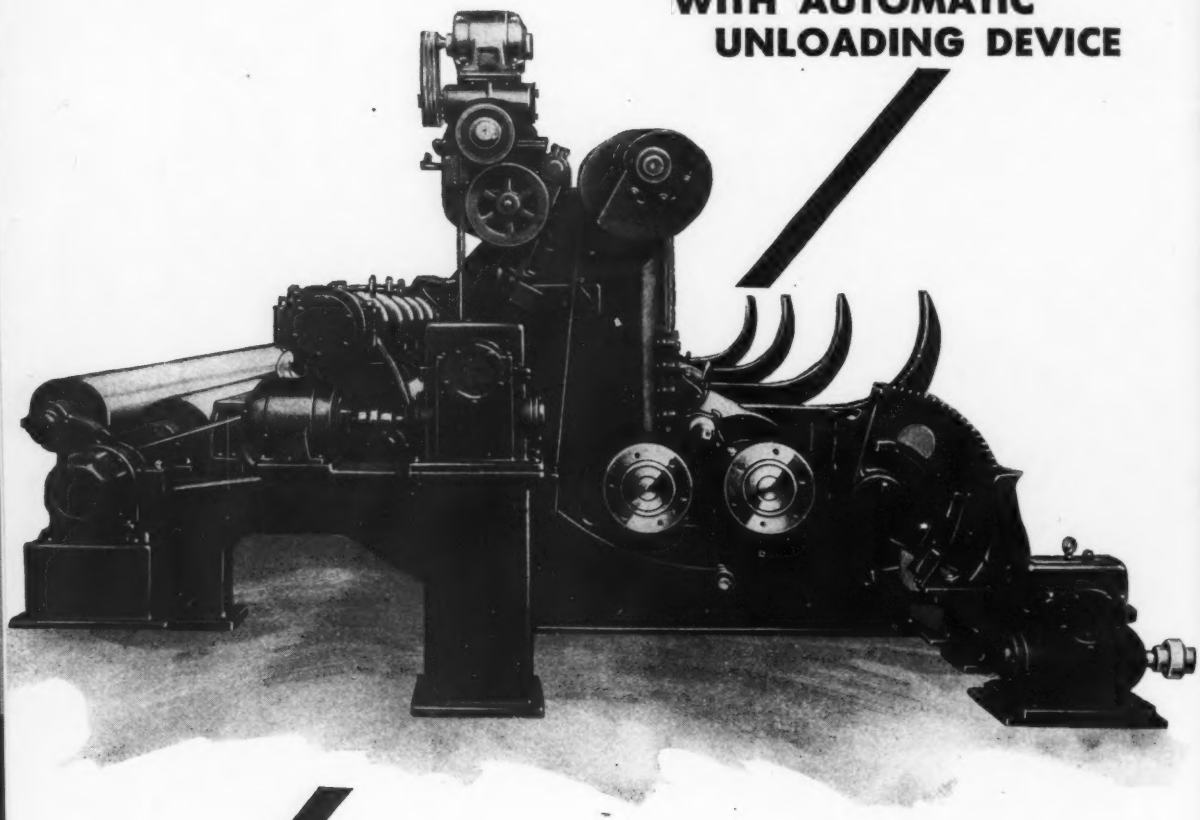

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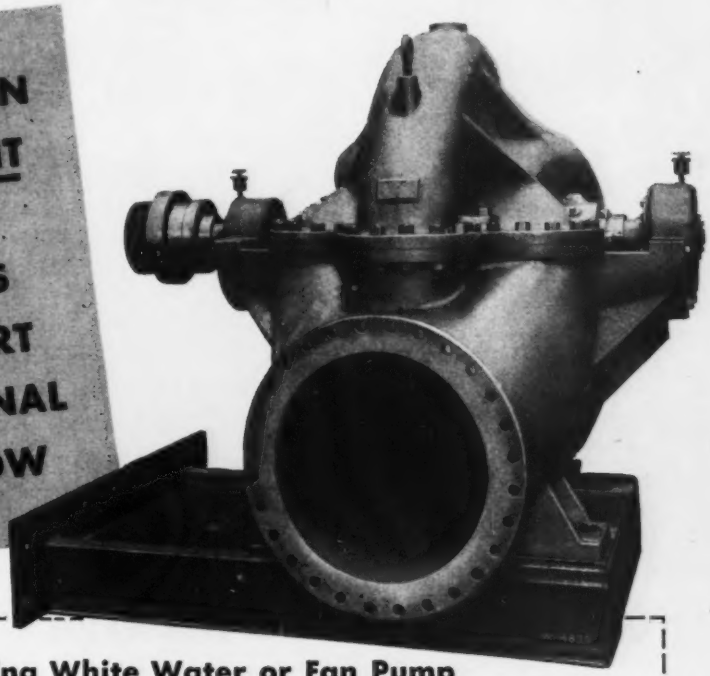

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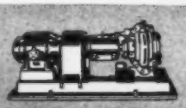

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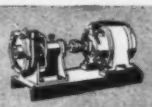

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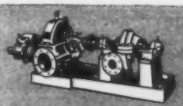

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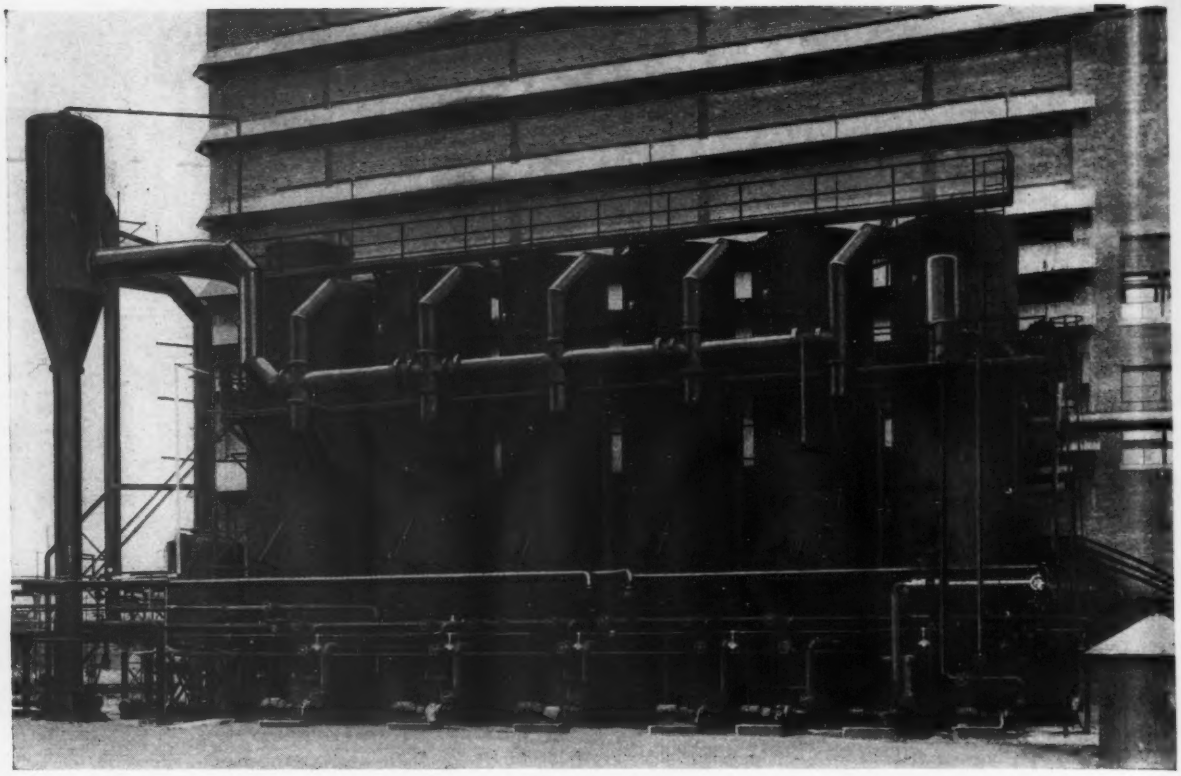

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Sveen Pedersen Flotation Saveall saves you more money by recovering more fibers and fillers than the conventional type savealls. Sveen Pedersen clarifies the water to such a high degree of purity that it can be extensively re-used in the system. Fresh water and fuel consumption are greatly reduced and steam improvement problems virtually eliminated.

Other Advantages of Sveen Pedersen

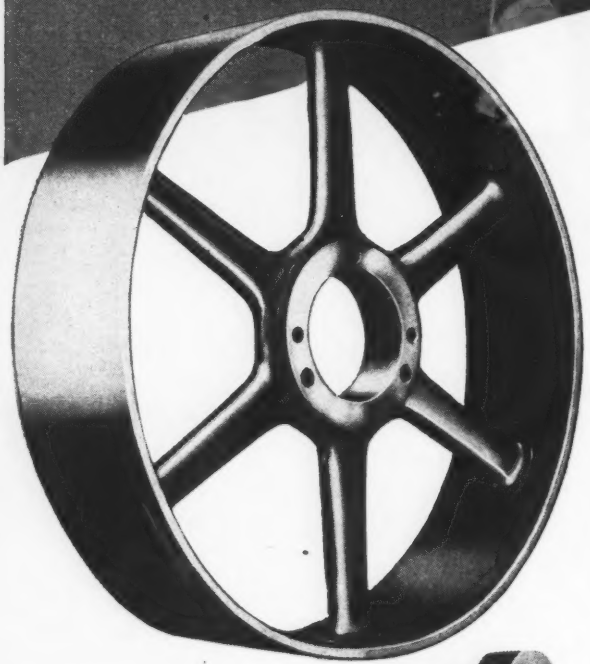
Low maintenance cost • Rapid Circulation through the System • High Efficiency on Heavily Loaded Stock • Insensitivity to Ordinary Fluctuation in White Water Flow • Ease of Cleaning

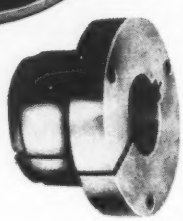
BULKLEY, DUNTON PULP CO., INC.
295 MADISON AVENUE, NEW YORK 17, N. Y.

In Canada: **ALEXANDER FLECK, LIMITED**
416 WELLINGTON STREET, OTTAWA, ONTARIO

Announcing . . .

THE NEW *Wood's* PULLEYS *with* INTERCHANGEABLE "*SURE-GRIP*" HUBS





One-piece flanged and split tapered hub permits easy installation and removal from shaft.

Now, you can carry a stock of both pulleys and sheaves with the same interchangeable "Sure-Grip" hub as used with our "Sure-Grip" Sheaves.

1. *No additional stock* of hubs needed.
2. *No increase in price* over standard pulleys.
3. *Just three hubs* take care of bore range from 1 ½" to 2 ⅞".

"*Sure-Grip*" *Pulleys*—cast iron with crowned face—are available *in stock* as listed in table.

HUB TYPES

DIA.	BELT WIDTH (INCHES)				
	2½	3	4	5	6
4	SD	SD	SD		
5	SD	SD	SD		
6	SD	SD	SF	SF	SF
7	SD	SD	SF	SF	SF
8	SD	SD	SF	SF	SF
9	SF	SF	SF	SF	SF
10	SF	SF	SF	SF	SF
12	SF	SF	SF	SF	SF
14	SF	SF	SF	SF	SF
16	SF	SF	SF	SF	SF
18	SF	SF	SF	C	C
20	SF	SF	SF	C	C
24	SF	SF	SF	C	C

For further information, write

T.B. *Wood's* SONS CO., CHAMBERSBURG, PA.

UFORMITES Boost Wet Strength As much As 300%...

... and increase dry Mullen and fold values 10% to 30%—at a cost as low as $4.00 per ton of paper pulp.

In Kraft stocks a 3-fold increase in wet-strength is typical when UFORMITE 467 is used. UFORMITE 470 gives similar increases in rag, sulfite, groundwood and stocks where low acidity is important. Wet rub, scuff resistance, "pick" resistance and service strength are all greatly improved in bag and liner stocks, map paper, blueprint paper, toweling, frozen food wraps and tag stocks. Yet no odor, taste or color is imparted, and the "feel" remains the same.

With UFORMITE urea formaldehyde resins no pretreatment is needed—no special processing or machines. Simply add UFORMITE at the beater, just as you would a rosin size, or add UFORMITE 470 at the wet end after the Jordans. Broke may be de-fibred without special equipment or long beating cycles.

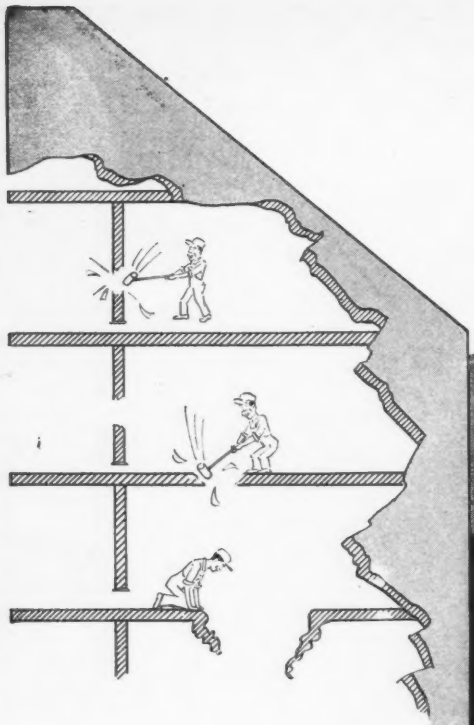
For low-cost paper improvement—and satisfied customers—investigate the UFORMITES today. Your copy of our latest booklet on the UFORMITES is being held for you. Write for it now.

UFORMITE *is a trade-mark, Reg. U. S. Pat. Off.*

Our seal, adopted from the alchemist's symbol for a resin, means better products for you through Resinous Products.

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.



TEAR OUT YOUR FLOORS!

INSTALL A MODERN ROLL-HANDLING SYSTEM

The Cleveland Tramrail roll grab picks up rolls, sets them down or turns them from vertical to horizontal position or vice versa. All motions are motor-driven and controlled by the crane operator in the cab.

If you are struggling with the problem of storing and handling paper rolls in a multi-floor building with low ceilings as illustrated above, we say, "Tear out your floors and install a modern Cleveland Tramrail roll-handling system."

You then will have a single large, light, airy room in which several times as many rolls can be stored as on individual floors. Even if all of your present building is not required for roll storage purposes, you may find it profitable to make this change because of the tremendously increased capacity and the drastic reduction in roll-handling costs.

With a Cleveland Tramrail system, rolls can be stored vertically 42 feet and higher and the entire floor area utilized. Different types of paper are easily stored and retrieved. One man working in the crane cab usually can handle all operations in a large warehouse.

Let a Cleveland Tramrail engineer give you the details.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

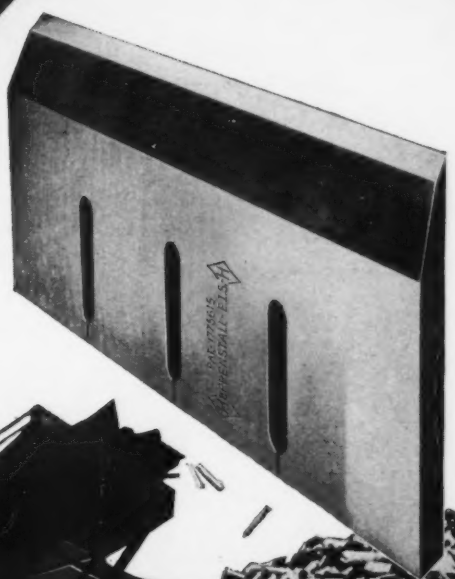
CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7114 East 287th St. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Chipping harder woods?

use

Heppenstall E. I. S. Knives



Impco FLAT SCREENS

Here are a few pictures of a recent Impco installation at West Virginia Pulp and Paper Company's plant in North Charleston, South Carolina. Special attention is given to keeping air out of the stock thus promoting faster screening and thickening.

The new Impco Flat Screens are designed for getting the most from any bronze or stainless steel plate. Look for:

- *Rigid Cast Bronze Vats*
- *Silent adjustable, positive stroke, eccentric drive—anti-friction bearings*
- *New replaceable bevel plate fasteners*
- *Higher capacity with extra large outlets*
- *New plate-end fastenings—eliminating wood sealing strips*

Let us work with you to achieve higher capacity, finer quality.

Improved Paper Machinery Corporation

NASHUA, NEW HAMPSHIRE

A-12

⇩ *Screens and Vacuum Deckers. Piping is below floor*

for
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for
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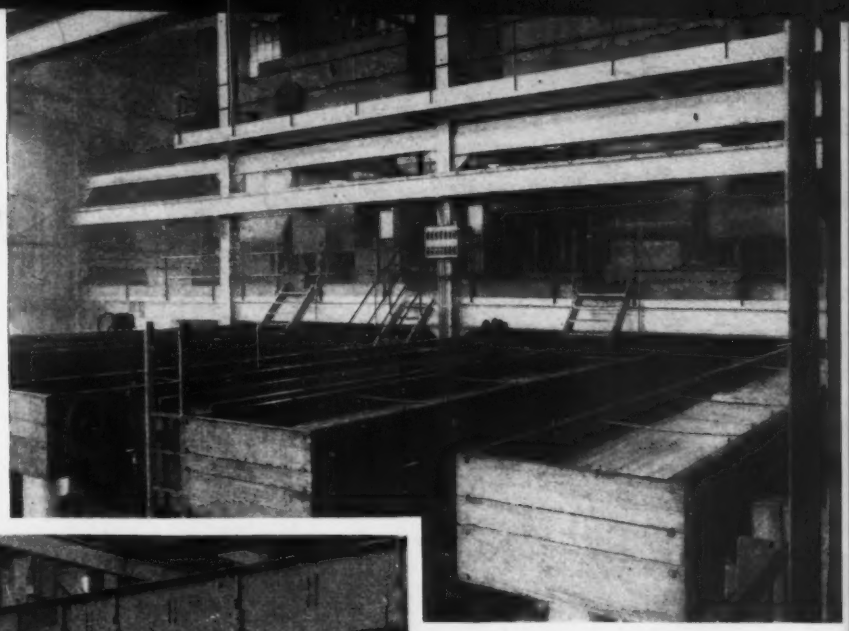
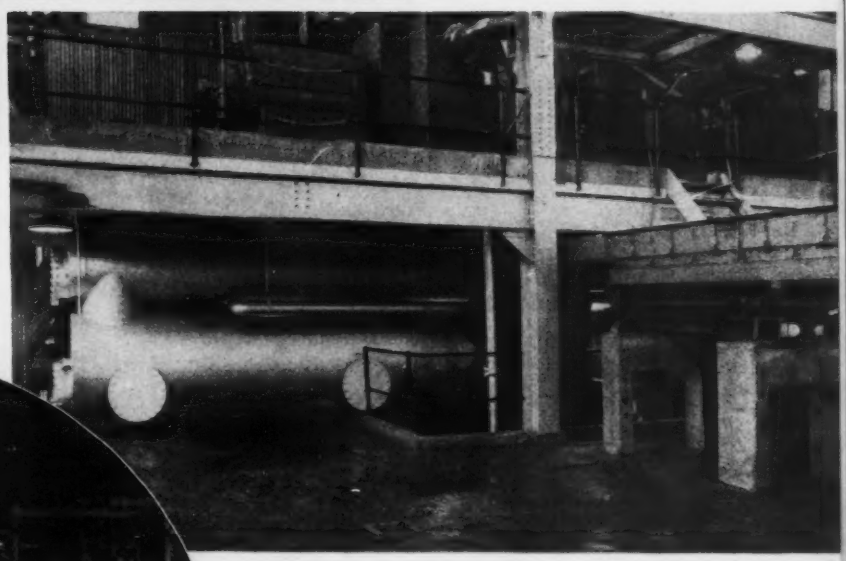
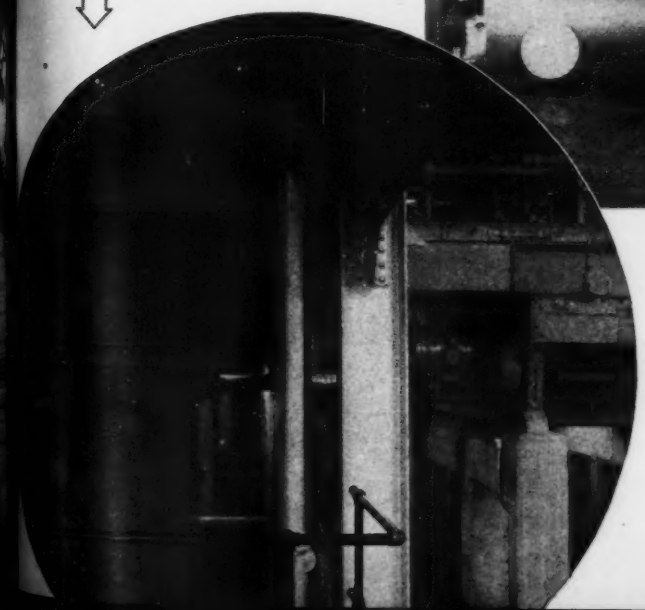


Two Stock Volume Meters with Consistency Regulators govern steady flow through Impco Knotters and Screens

Bronze Vat Screens, two per line mounted for easy maintenance



Pressure Stock Headers with Submerged Inlets and "Forming Aprons" for uniform distribution to Screens



"From Cooking to Use"

IMPCO

Pulp Mill Equipment

Our service simplifies

your paper work!

When you have paper production problems
remember that STEIN-HALL—
with its years of "know how"—
is eager to be of assistance.

Our salesmen...
more than just selling quality starches,
dextrines and gums...
are technical experts
...versed in applying these products
in actual use.

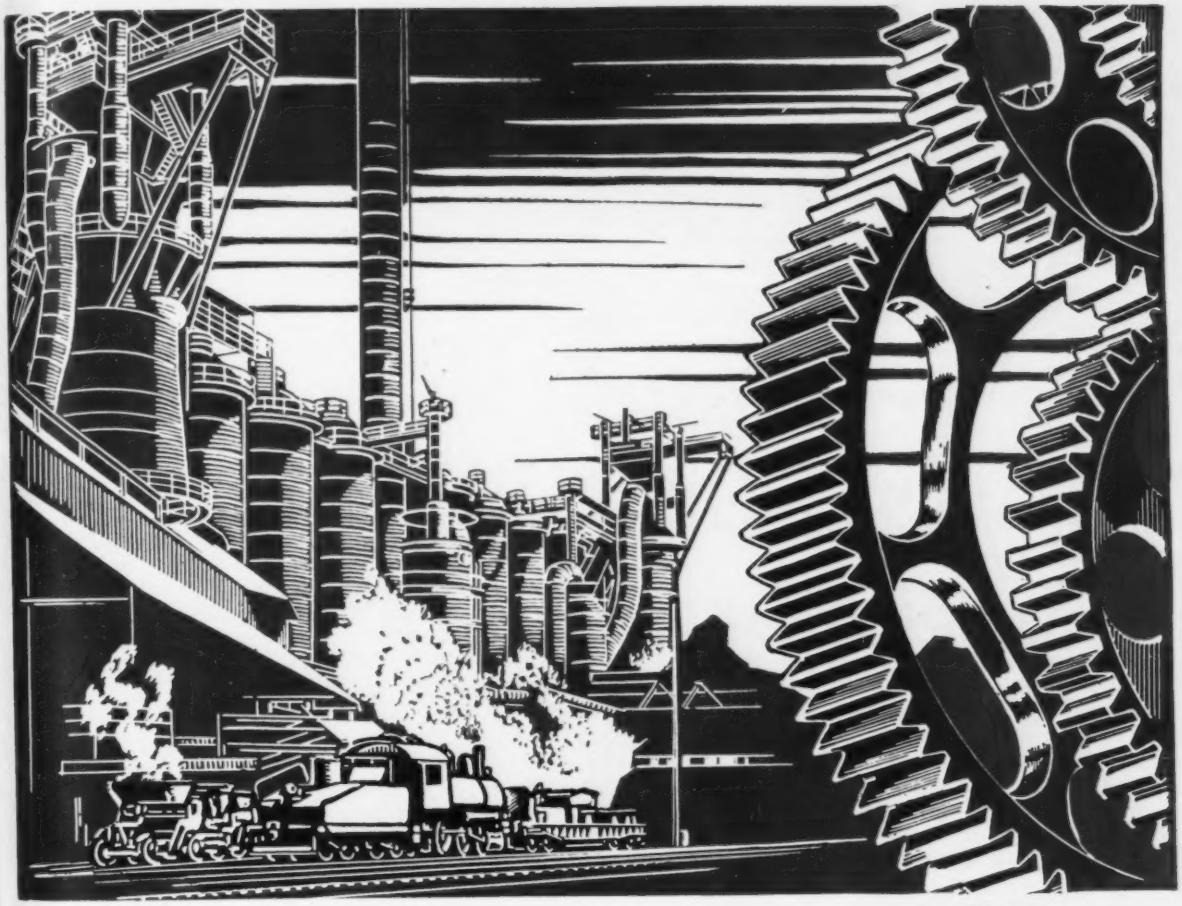
And those questions which
our salesmen cannot answer...
we will turn over to our fully staffed laboratory,
which is also at your beck and call.

At any time...
your nearest STEIN-HALL man
can be counted on for
prompt, thorough attention.

STARCHES, DEXTRINES AND GUMS
for the Paper Industry
LABORATORY-CONTROLLED FOR QUALITY
AND UNIFORMITY

STEIN SH HALL
293 MADISON AVENUE NEW YORK 17, N. Y.

YES! Tycol "Engineered Lubrication" performs better . . . BETTER . . . BETTER



Tycol Engineered Lubrication performs better because:

. . . *Tycol Engineered Lubrication* is scientifically engineered to meet every service condition in modern industry, no matter how extreme or unusual.

. . . *Tycol Engineered Lubrication* helps you "get it done" faster and more efficiently . . . production jumps when you switch to a Tycol oil or grease.

. . . *Tycol Engineered Lubrication* means new economies for you . . . by cutting repair bills, and lengthening equipment life.

Let Tide Water Associated help you select the best lubricant for your particular need. Write, wire or phone today to your nearest Tide Water Associated Office.

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17 BATTERY PLACE · NEW YORK 4, N. Y.

LUBRICATION — "ENGINEERED TO FIT THE JOB"

make it a

One-Piece Pipe Line

with SILBRAZ* joints

Silbraz joints, made with Walseal* valves, fittings and flanges, actually make a "one-piece pipe line" of brass, copper, or copper-nickel I.P.S. pipe or tubing . . . leaky joints are completely eliminated, and maintenance costs are reduced to the minimum.

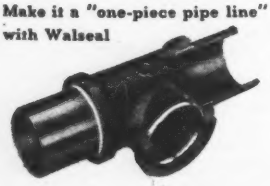
A Silbraz joint is *silver-brazed* — not soldered. This modern pipe joint will not creep or pull apart under any condition which the pipe itself can withstand . . . vibration or corrosion will not affect it. A Silbraz joint is designed to have a tensile strength equal to about three times standard weight brass pipe, and the pipe will fail before the joint will pull apart.

For full information about Silbraz joints made with Walseal valves, fittings and flanges, see your nearby Walworth distributor, or write for Circular 84.

Patented — Reg. U. S. Patent Office

SEE OUR CATALOG IN SWEET'S

Make it a "one-piece pipe line" with Walseal



WALWORTH

valves and fittings

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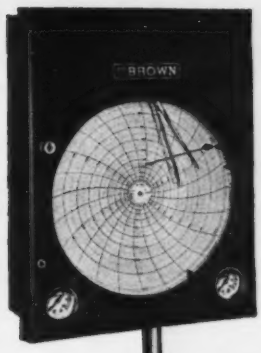
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

LEVEL CONTROL

With just the right element for your job.



LIQUID LEVEL control assumes extraordinary importance in the Paper Industry. The liquid level controller has a direct effect on chemical concentrations in many processes, and on the mechanical operation of others. From an over-all viewpoint, *precise* liquid level control is vital in maintaining equilibrium of plant processes. Precise control eliminates those upsetting variations that are always dogging production.

The basis for precise control is accurate, sensitive measurement. That is why the whole array of measuring elements available in Brown Liquid Level Controllers is so important. One element could be adjusted to measure a wide range of liquid level applications but not without sacrificing the power and sensitivity so important for good control.

In Brown Liquid Level Controllers, the exact measuring element is available to suit your job. This measurement accuracy combined with the well-known Brown *Air-o-Line* control unit produces liquid level control of unequalled performance.

The Brown Instrument Co., 4510 Wayne Ave., Philadelphia 44, Pa

DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR CO.

Offices in principal cities of the United States, Canada and throughout the world

INSTRUMENTATION for the PAPER INDUSTRY

This free 80-page book is a virtual handbook covering the instrumentation of all important paper mill processes. It contains 28 schematic drawings as well as page after page of informative data. Write for Bulletin 2801.

BROWN *Advanced Instrumentation* **FOR BETTER PROCESSING**

Product of MINNEAPOLIS **Honeywell**

HYCAR AMERICAN RUBBER LATEX... imparts valuable properties to pulp and paper

HYCAR latex added directly to the pulp in the beater or head box, or used as an impregnant for paper, imparts valuable properties not otherwise readily obtained.

Tear and wet strength are considerably increased. Resistance to oils, solvents and chemicals is obtained, with retention of good aging properties. The addition of Hycar also insures excellent flex life and scuff resistance, and in thick papers prevents separation of the laminations.

Thus, better physical properties may be obtained in high grade pulp. In other cases the use of lower grade stock may be permitted because of improved physical properties obtained by the use of Hycar latex. Paper is made adaptable to fields where it is not now used.

Present and potential applications for papers of this sort range from wallpaper to insoles, from gaskets to leather replacement material, from shelf liners to packaging papers.

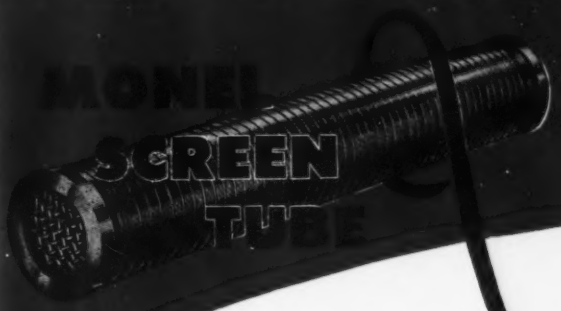
HYCAR latex is very easy to use. In most applications no vulcanization is required. Normal drying times are used. And HYCAR latex is an inherently safe material to handle. *No solvent system is needed.*

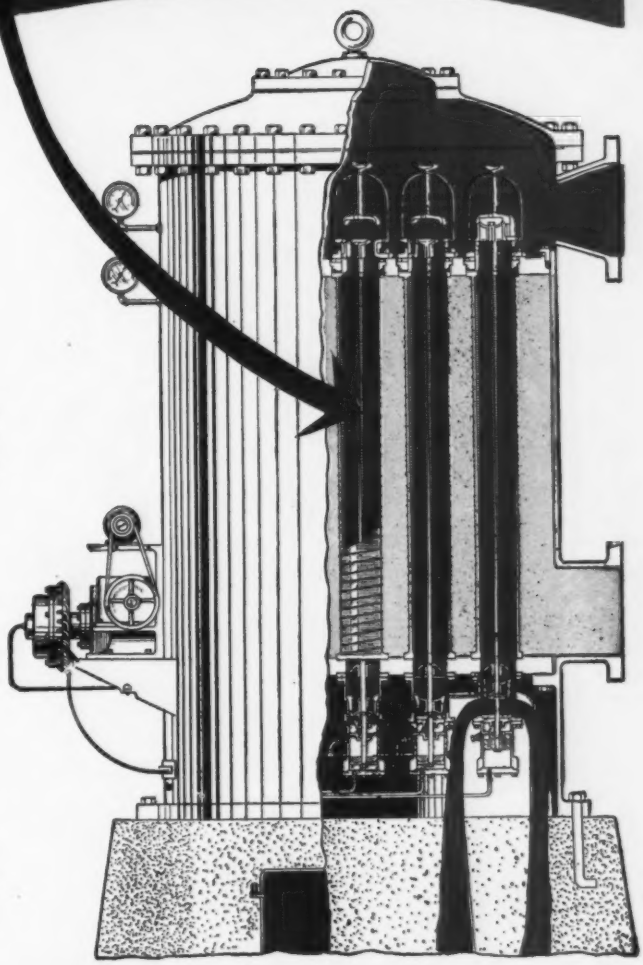
We would be glad to work with you on any problems relating to the use of HYCAR latex. For more information, please write Department HJ-10, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

Hycar
Reg. U. S. Pat. Off.
American Rubber

B. F. Goodrich Chemical Company
A DIVISION OF THE B. F. GOODRICH COMPANY

ADAMS AUTOMATIC WATER FILTERS





Performance-Proved

BY THE PAPER INDUSTRY

✔ *for* PRIMARY FILTRATION

PORO-SCREEN Filters are a practical method for filtering water direct from the river or other source. Removes sand and grit 15 times finer than 1/32". Delivers a large volume of filtered water suitable for general mill service in the processing of newsprint, box board and other coarse grades of paper stock.

✔ *for* SECONDARY FILTRATION

PORO-STONE Filters provide effective filtration for water required in high grade paper stock. Installed following sand filter equipment, the PORO-STONE Filter eliminates finest sand, pipe scale and all foreign matter which might impair paper quality.

•

ADAMS Filters (both PORO-SCREEN and PORO-STONE) are designed for continuous, automatic operation. No moving clearances to pass foreign material—no shut-downs required by back-wash cleaning—very little attention needed. *Constant filtration assured at all times.* Built in several sizes to meet your requirements. Write for Bulletin 901.

★ R. P. ADAMS COMPANY, INC. ★

231 EAST PARK DRIVE, BUFFALO 17, N. Y.

ADAMS FILTERS

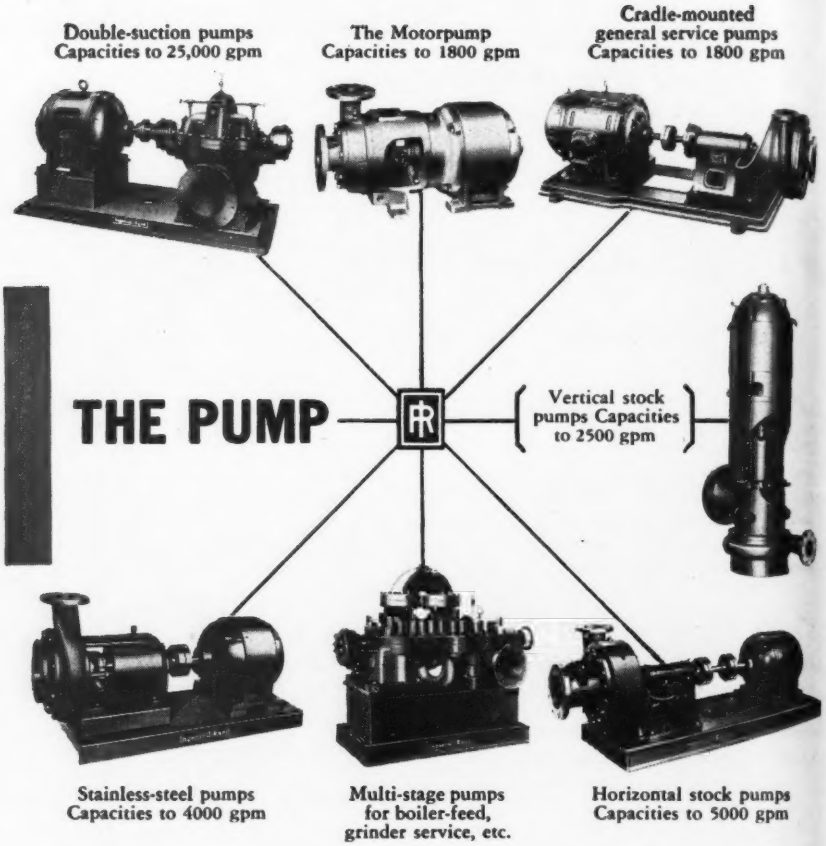
PORO-STONE
AND
PORO SCREEN

You specify

THE FLUID, TEMPERATURE, AND PRESSURE

We'll specify

THE PUMP



Ingersoll-Rand builds practically all types of pumps for pulp and paper mill service—stock, black liquor, acid, white water, boiler-feed, waste liquor, shower, water supply—

There is a pump in this line to meet any condition encountered in normal pulp or paper mill practice. Furthermore, many of these pumps have been developed to the special needs of the paper industry.

Ask the Ingersoll-Rand engineer to recommend pumps to suit the layout in your mill. Ingersoll-Rand Company, Cameron Pump Division, 11 Broadway, New York 4, N. Y.

AIR TOOLS ROCK DRILLS
COMPRESSORS • TURBO BLOWERS
CENTRIFUGAL PUMPS • CONDENSERS
OIL AND GAS ENGINES

Ingersoll-Rand

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MIDVALE WATER BOX ROLLS LAST LONGER

Many paper mill men have dreamed of a roll in the wet position of the mill calender that would not pit or corrode . . . and that would not need grinding at frequent intervals. For these men, Midvale offers an authentic case history of two Midvale stainless steel rolls which demonstrates how their own roll troubles can be cured.

A paper mill in Michigan installed two of our forged, hardened and ground stainless steel calender rolls in October, 1947. *For more than eight months*, these rolls have been working for him without the need for grinding and still show no evidence of pitting or corrosion. This customer is now equipping all his mills with Midvale stainless steel rolls in the wet position. The fact that he has saved nearly $15,000 in grinding costs alone on the original two rolls convinced him. Be convinced, yourself. Send for your copy of MIDVALE FORGED, HARDENED AND GROUND ROLLS FOR PAPER MILLS.

THE MIDVALE COMPANY • NICETOWN • PHILADELPHIA

OFFICES: NEW YORK • CHICAGO • PITTSBURGH
WASHINGTON • CLEVELAND • SAN FRANCISCO

STAINLESS AND TOOL STEEL BARS
•
CORROSION AND HEAT RESISTING CASTINGS
•
FORGINGS AND RINGS

MIDVALE
Custom Steel Makers to Industry

"I've found it pays to go to headquarters..."

When I need expert advice on tubing for anywhere in the mill I take it up with NATIONAL Tube."

LIFE runs smoother for a good many pulp and paper mill engineers who have made it a habit to get our recommendations on their alloy tubing problems. Because we have been successfully applying steel tubes to every industry for sixty years we have been able to make sound, practical suggestions in the selection and use of tubing that has saved them money again and again. We can do the same for you.

Whether you plan to rehabilitate present equipment or to expand your facilities, we can show you how to keep down tubing costs, how to obtain better efficiency in performance, how to lengthen life between replacements. As the world's largest producer of steel tubular products, we are equipped to produce steel tubing in the widest range of size and wall thickness and in every tubular steel analysis from low carbon to the finest alloy and stainless steels.

No matter what the requirements, we will gladly help you make the best selection of tubes for your purpose. It pays to come to NATIONAL — "headquarters for alloy steel tubes."

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Tubing Specialties Division

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL

Your Choice of Chemicals COUNTS!

In almost every step of paper manufacture from the preparation of pulp to the sizing, filling, and coating of the finished sheet, chemicals are indispensable and must be chosen with exacting care. Paper makers who want to be sure of the quality and uniformity of the alum, salt cake, and other process chemicals they use, specify "General Chemical."

ALUMINUM SULFATE

Standard: Lump; Ground, 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh.

Iron Free: Lump, approx. 2½"; Ground, thru 8 mesh.
Liquid

SODIUM SULFATE

(Salt Cake) . . . Paper Makers' Grade, thru 8 mesh.

OTHER PRODUCTS OF GENERAL CHEMICAL FOR THE PAPER INDUSTRY

- Glauber's Salt (Crystal and Anhydrous)
- Sulfuric Acid
- Sodium Hyposulfite
- Sodium Sulfite (Anhydrous)
- Sodium Silicate
- Chromium Potassium Sulfate (Potash Chrome Alum)
- Aqua Ammonia
- Sodium Fluoride
- Tetrasodium Pyrophosphate (Anhydrous)
- Sodium Bisulfite (Anhydrous)
- Nitric Acid
- Sodium Sulfide
- Hydrochloric Acid
- Sodium Metasilicate
- Trisodium Phosphate
- Copper Sulfate
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ALLIED CHEMICAL & DYE CORPORATION
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BASIC CHEMICALS
GC
FOR AMERICAN INDUSTRY

VORTRAPS

HAVE A WIDE RANGE OF USES

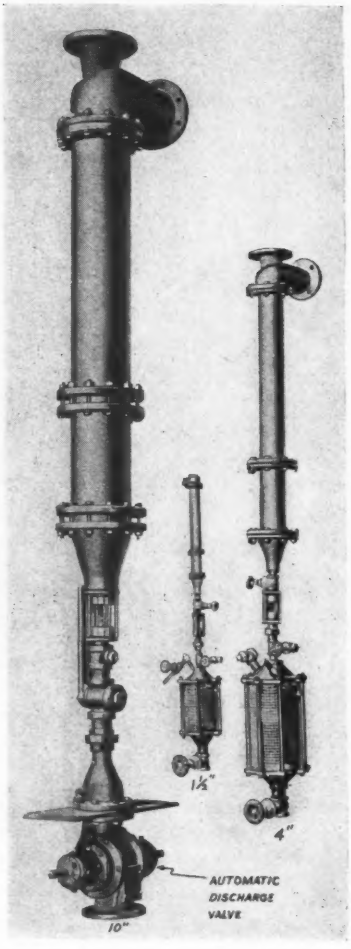
For Rough Papers

FOR WASTE PAPERS

The 8″ and 10″ Vortraps are very effective in removing abrasive dirt, glass, rubber, sand and similar foreign materials.

Operation can be standard by use of waste receiver which requires manual dumping, or *completely automatic* through use of our newly developed automatic discharge valve.

These units are of particular value to *Board Mills* and *De-inking Systems.*



For Fine Papers

Standard Vortrap System

For a smaller system where fine dirt and removal of abrasive materials are the main objectives — manual care is required for this system.

Primary-Secondary Vortrap System

For larger systems where removal of abrasive dirt, bark specks, shives and similar materials are the main objectives. This system is *entirely automatic* and requires *no manual care.*

Bleed principles of this system are particularly effective for light foreign matter removal. These principles are patented.

GENERAL:

1. *Screen Tailings* - - - Effectively cleaned by Vortraps.
2. *Pulp Mill Installations;*
   Large volumes of stock may be cleaned effectively by a combination system of the larger and smaller Vortraps.
3. *Chemical solutions* in small volumes may be cleaned with the 1½″ and 3″ Vortraps.
4. The elimination of solids and foreign matter from *slurries* and *water* is another of the many uses of the Vortrap in its different sizes.

OTHER NICHOLS PRODUCTS FOR THE PAPER INDUSTRY

Monohearth bark burning furnace for the disposal of *wet bark.*
Ore roasters for the production of SO_2 gas. Other furnace applications.

NICHOLS ENGINEERING & RESEARCH CORPORATION
60 WALL TOWER • NEW YORK 5, N. Y.

A RESEARCH CORPORATION COTTRELL

will save you $1000 to $1500 worth of salt cake every day

The engineer from Research Corporation spoke confidently. He had studied the equipment layout, and noted that the mill had a capacity of 1,000 tons of pulp per day. From his experience and specialized knowledge he knew that he could safely anticipate a minimum recovery of 100 pounds of salt cake for each ton of pulp produced—total: 50 tons of salt cake per day—value: $1,000.00 to $1,500.00 per day dependent upon salt cake cost prevailing at the plant.

Performance like this is the result of over 35 years of experience combined with careful engineering appraisal, attention to details and a remarkably efficient method. These, plus equipment which gives recoveries of 90 to 99%, are responsible for outstanding records of recovery.

If you are losing your chemicals through the stack in a soda or sulphate mill investigate the Research Corporation Precipitator.

BC-108

Research Corporation Installations

47 CARBON BLACK PLANTS
200 METALLURGICAL INSTALLATIONS
203 ACID PLANTS • 34 PAPER MILLS
262 DETARRING INSTALLATIONS
195 POWER STATIONS
71 STEEL PLANTS • 95 OIL REFINERIES
AND MISCELLANEOUS INSTALLATIONS

RESEARCH CORPORATION

405 Lexington Avenue, New York 17, N. Y.
122 South Michigan Avenue, Chicago 3, Illinois

TITANOX . . . *the brightest name in titanium pigments*

"Show-Through" is through when TITANOX comes in

There isn't room for this "show-through" spook in paper. That's why paper makers use TITANOX pigments. These titanium dioxide pigments impart the utmost attainable degrees of opacity, whiteness and brightness, and minimize "show-through".

Paper takes on a more attractive appearance. Customers work without fear of print showing through. And you know how such desirable paper stock is easier to sell!

Due to the effectiveness of these pigments, the TITANOX line continues in greater demand than the output. To meet this demand, production is being increased as rapidly as possible. In the meantime, our Technical Service Laboratory can show you how to get the most out of your available supply. This help is yours by contacting our nearest office.

TITANOX

Reg. U. S. Pat. Off.

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT

111 Broadway, New York 6, N. Y.
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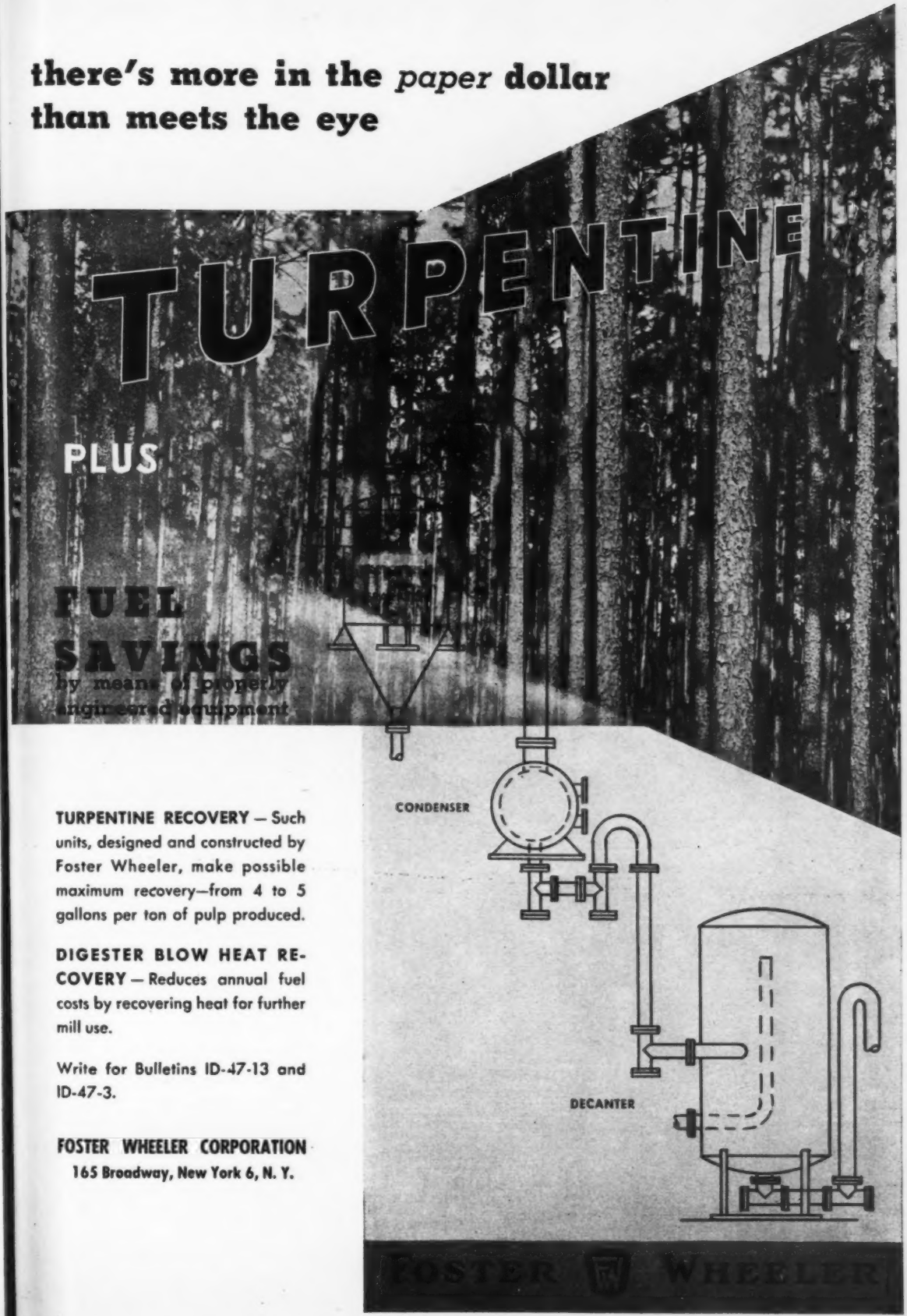
2600 S. Eastern Ave., Los Angeles 22, Cal.

there's more in the *paper* dollar than meets the eye



TURPENTINE RECOVERY — Such units, designed and constructed by Foster Wheeler, make possible maximum recovery—from 4 to 5 gallons per ton of pulp produced.

DIGESTER BLOW HEAT RECOVERY — Reduces annual fuel costs by recovering heat for further mill use.

Write for Bulletins ID-47-13 and ID-47-3.

FOSTER WHEELER CORPORATION
165 Broadway, New York 6, N. Y.

TENAX FELTS ARE ECONOMICAL

SERVING THE PAPER INDUSTRY SINCE 1891

Our research and development is paying off for our customers in longer service and lower costs. If you would share in these advantages we suggest you afford us the opportunity of serving you.

LOCKPORT FELT COMPANY • NEWFANE, NEW YORK

dyestuffs for coloring paper

by continuous process

in beater

at tub

on calender

in coating process

specially standardized for all types of paper and paperboard.

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435 HUDSON STREET, NEW YORK 14, NEW YORK

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GDC

REDUCE SCREENING LOSSES AS MUCH AS 40% PER WEEK WITH CRODON PLATING

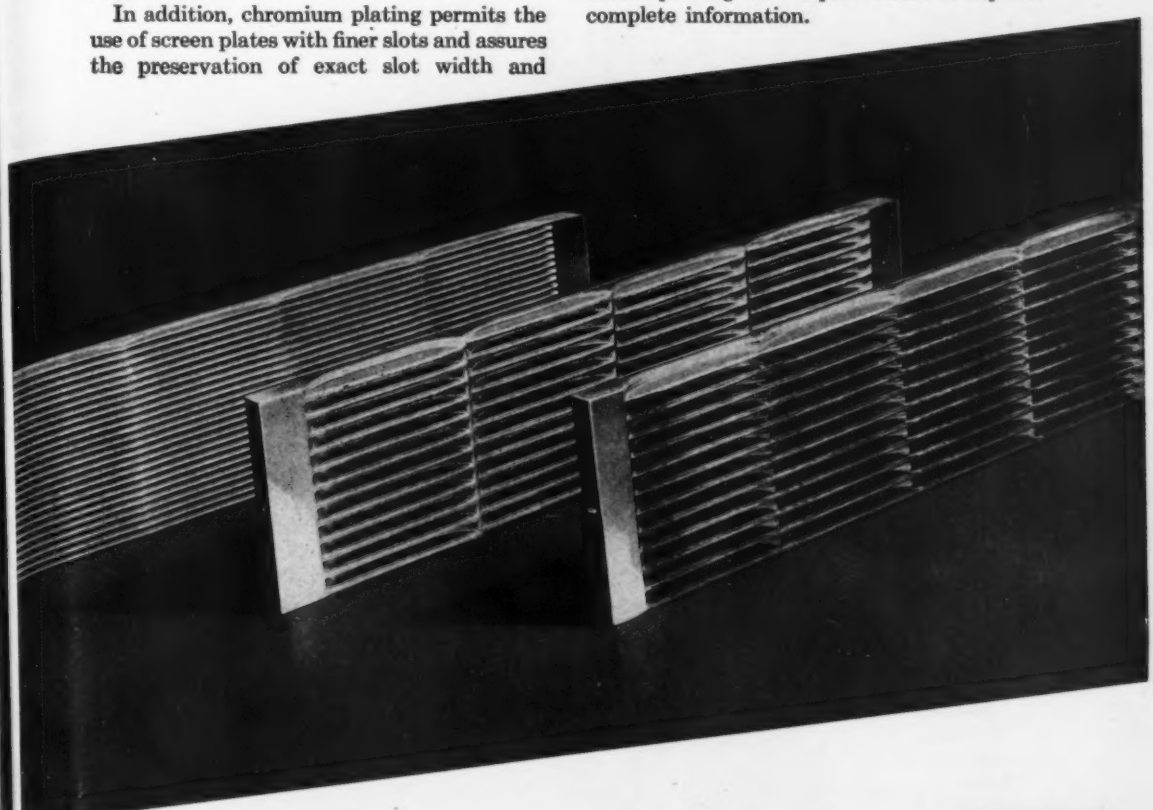
Take a *good* look at your screen plates. If you find them worn, rough and inaccurate... or with badly clogged slots causing heavy losses in screening capacity...you need the benefits of chromium plating.

The screen plates illustrated, for example, have been chromium plated and thus provided with a permanently hard, durable protection against wear and corrosion. The smooth, non-adherent properties of CRODON prevent the filling up or clogging of slots... known to cause losses in screening capacity as high as 40% in one week.

In addition, chromium plating permits the use of screen plates with finer slots and assures the preservation of exact slot width and smoothness. The results: greater production of a higher quality paper... fewer costly delays for cleaning or repairs.

NOW is the time to investigate how chromium plating can increase screening efficiency in your mill. One mill found that chromium-plated screen plates lasted four times as long as plain bronze plates.

By specifying CRODON when you chromium plate equipment, you are assured of the incorporation of all Chromium Corporation of America's skill and experience in electroplating technique. Write today for complete information.



CHROMIUM CORPORATION OF AMERICA

CRODON
The Chrome Plate

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Cedar 6660

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We move mountains

The organization of Elof Hansson maintains offices in:

Gothenburg
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and representatives in all key cities throughout the world!

. . . both literally and figuratively!

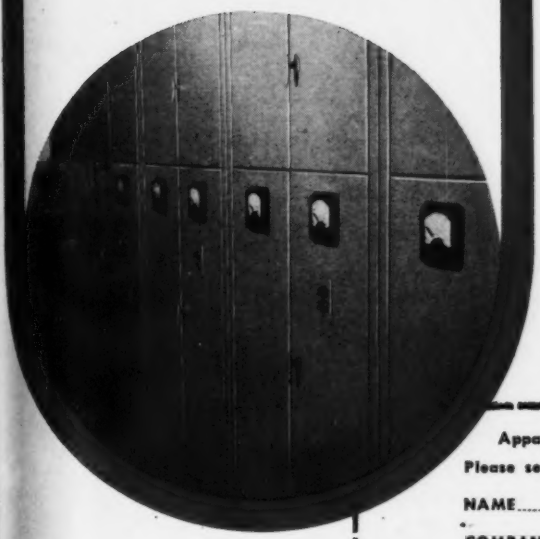
In the literal sense, through our intimate world-wide affiliations—branch offices and personal representatives—this international organization moves mountains of paper and woodpulp from the forest to the ultimate user. In the figurative sense, as importers and exporters of these materials, Elof Hansson, Inc. "moves mountains" in serving both buyer and seller quickly and efficiently regardless of where they are located.

ELOF HANSSON, INC.

220 EAST 42ND STREET NEW YORK 17, N. Y.

Two beaters, each powered by a 400-horsepower G-E synchronous motor, start the production of 50 tons of paper a day at The Chase Bag Company

protected... BY GE LIMITAMP



1900 horsepower's worth of paper production

At the Chase Bag Company's Chagrin Falls mill, two beaters, two Jordans, and a Fourdrinier paper machine are powered by G-E synchronous motors and a 10-unit m-g set controlled and protected by five G-E Limitamp controllers. These machines produce 50 tons of paper a day, and loss of a day's production cannot be recovered in a month or even a year if a breakdown occurs. It's important to prevent electrical disturbances resulting from short circuits—and that's where G-E Limitamp proves its worth.

Advantages for you, too . . .

In 1/120 of a second Limitamp operates to prevent the spread of short-circuit damage. These controllers are not only quick acting (because of special EJ2 fuses), but the contactors are especially designed to stand up under several million operations—providing much longer life than is usually possible for such high-voltage equipment. Limitamp is also applicable for semi-hazardous or corrosive atmospheres.

Apparatus Dept., Section B676-260, General Electric Co., Schenectady 5, N. Y.
Please send me your publication GEA-4247 describing the Limitamp controller.

NAME.....

COMPANY.....

ADDRESS.....

GENERAL ELECTRIC

You can STOP STREAM POLLUTION

and Profit!

The Permutit White Water Reclaimer stops stream pollution, concentrates pulp fibre and filler in white water to make more paper, and permits recycling of the process water. All in one compact operation. A Permutit White Water Reclaimer *more* than pays for itself!

Check your white water problems with Permutit, and consult with Permutit engineers without obligation. Merely write to the Permutit Company, Dept. PT-9, 330 West 42nd Street, New York 18, N. Y. If in Canada please write to the Permutit Company of Canada, Ltd., Montreal.

Permutit

FOR 35 YEARS WATER CONDITIONING HEADQUARTERS

Interesting facts about PAPER

Photo Courtesy Mr. R. A. Hayward

Papermaking was regarded as a high art in Elizabethan England, where the Queen knighted her papermaker, Sir John Spilman. A shrine to his memory stands in Dartford Church, Kent, and it has been preserved by contributions from the English Fraternity of Papermakers.

INTERESTING FACTS ABOUT HELMERCO BLUE

For producing superior whiteness in bond, writing books and ledgers, HELMERCO BLUE has long been a standard requirement. Added at the beater, it has good working properties and excellent light fastness. It also produces fine light blues in the same group of papers; and in the tinting of paper coatings HELMERCO BLUES produce the much desired high white shade in any formula.

HELMERCO BLUES are available in a range of shades from red to green: M4R Conc., M2RW Conc., MGW Conc., MG Conc., 2GB Conc., M2G Conc., M4G Conc., and M5G.

Consult your Calco representative for aid in developing special dyes for specific purposes.

Calco

CALCO CHEMICAL DIVISION
Heller & Merz Department

AMERICAN CYANAMID COMPANY
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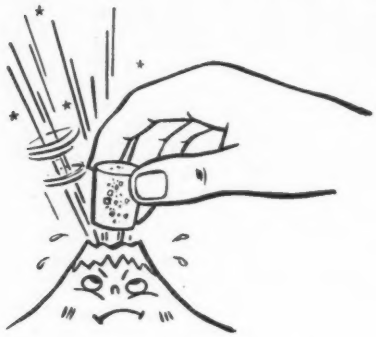
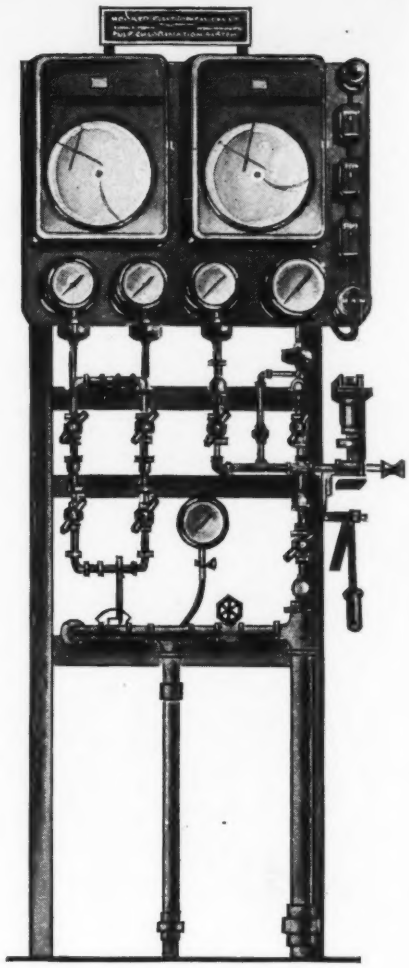
Keeping Chlorine Under Control





IN THE early thirties the use of liquid chlorine was well established in the pulp and paper industry. Hooker, as a basic supplier of chlorine, concentrated on improving methods of control and safe handling. This type of work was quite necessary for at that time all of the needed equipment was not available from equipment manufacturers because needs were not yet standardized.

With respect to chlorine handling, the problems of the paper industry were also the problems of the chlorine supplier. Hooker's close cooperation with the industry resulted in the solution of many of these problems of control. One advance in this respect was the design of a centralized control panel which grouped valves, gages, recorders and switches in one assembly and thus greatly simplified operation.

Another relatively simple device resulted in a greater measure of safety in chlorine handling. Liquid chlorine's coefficient of thermal expansion is so high that a small temperature rise can develop sufficient pressure to rupture a closed pipe line. To prevent this, Hooker engineers devised an expansion chamber from an inverted chlorine cylinder attached to a tee in the pipe section between valves. This expansion chamber, carrying a padding of air, was soon replaced by a heated enclosed expansion chamber which maintained a constant cushion of gaseous chlorine in the chamber.

Another improvement Hooker made at this time was an automatic shut-off valve installed between the chlorine control valve and the chlorinator or mixer. This prevented the release of chlorine in the event that the stock chest became empty or the stock feed motors failed. This filled the gap until valve manufacturers offered suitable ones.

While today the pulp and paper maker initiates most of his own engineering work, Hooker is still being called upon for assistance. Our Technical Service Department is in constant touch with the industry and is always available for assistance in using Hooker chemical safely and economically.

HOOKER ELECTROCHEMICAL COMPANY
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New York, New York • Wilmington, California • Tacoma, Washington

HOOKER CHEMICALS

From the Salt of the Earth

8-833 Caustic Soda Muriatic Acid Sodium Sulfide Paradichlorobenzene Sodium Sulfhydrate Chlorine

(A Quick Quiz on modern pH advancements)

Do you know these important facts about BECKMAN pH CONTROL?

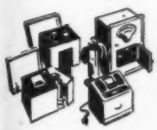
Do you know...

That Beckman pioneered modern glass electrode pH equipment?

Until Beckman pH instruments were developed, glass electrode pH equipment was a cumbersome, complicated laboratory curiosity. It was Beckman that pioneered today's simple, compact, highly accurate and completely dependable glass electrode pH equipment!

That Beckman pioneered virtually every major development in modern glass electrode pH equipment?

Such far-reaching advancements as the High pH Glass Electrode . . . the High Temperature Glass Electrode . . . the Unusually Rugged "X-9" Glass Electrode . . . as well as a wide range of other vitally important advancements in glass electrode pH instrumentation, were *all* pioneered by Beckman. *Many of these advancements are still available exclusively in Beckman equipment!*



That Beckman offers the industry's most complete line of glass electrode pH instruments?

Included in the complete Beckman line are instruments specially designed to combine the high precision and wide versatility necessary for advanced research, medical and laboratory applications . . . others that combine maximum simplicity and high accuracy with complete portability for plant and field applications . . . still others that combine maximum simplicity and high accuracy with the plug-in convenience of full AC operation . . . plus *completely automatic* pH equipment for continuous pH indication, recording and control on large-scale processing applications.

That Beckman also provides the industry's most complete line of modern glass electrodes?

Although glass electrode pH instruments are the most efficient pH equipment obtainable, no glass electrode pH instrument is better than the versatility, accuracy and dependability of the electrode assemblies available for use with it.

Beckman provides the industry's most complete line of glass electrodes for use with Beckman pH instruments—a type of electrode assembly to meet every industrial, research, laboratory and field requirement!

That there are so many money-saving applications for Beckman pH control that you may be losing important profits unless you make a complete investigation of your operations?

There is pH wherever there's water, water solutions, moist pastes, sludges, slurries or other moisture-containing substances. And wherever there is pH, chances are the operation can be done better . . . with greater uniformity and less waste at lower overall cost . . . by Beckman-controlling the pH of the various processing operations.

WHETHER you manufacture food products or treat sewage . . . do metal plating or refine crude oil . . . make textiles or process ore — in fact, no matter WHAT *your field of operation . . . if you have not yet determined whether Beckman pH Control can be used to advantage in your operations — possibly is already* BEING *used to cut costs by your competitors — let us study your processes and make helpful recommendations. No obligation, of course.* BECKMAN INSTRUMENTS, NATIONAL TECHNICAL LABORATORIES, SOUTH PASADENA, 16, CALIFORNIA.

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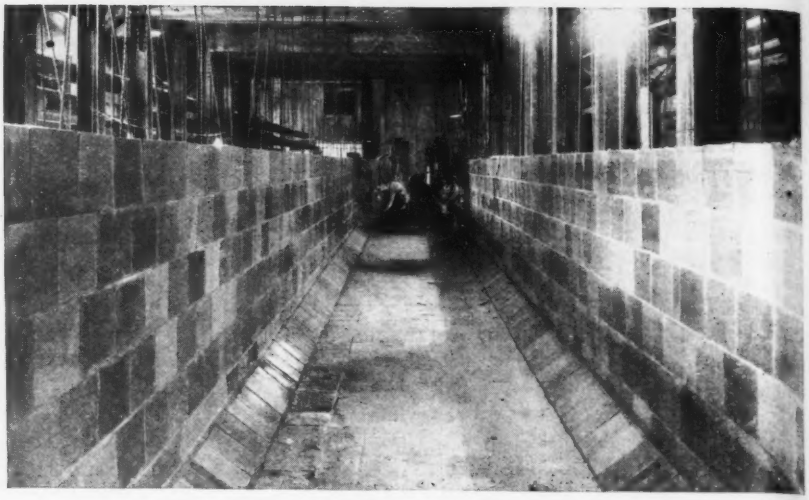
For an informative, non-technical outline of modern pH control — what it is and how it's used — send for this free booklet "What Every Executive Should Know About pH."

INSTRUMENTS CONTROL MODERN INDUSTRIES

pH Meters and Electrodes — Spectrophotometers — Radiation Meters — Special Analytical Instruments

Tile Chest *78 feet long*



another use for **KALAMAZOO GLAZED TILE**

Inside view of a Tile Chest in course of construction, 78 ft. long, 17 ft. wide and 14 ft. high. Propellor agitator is located at each end.

The slick glazed walls assist agitation in this big chest and it is easier to keep clean as it can be quickly flushed down with a hose.

Kalamazoo Glazed Tile has many decided advantages for large, capacity chests.

KALAMAZOO TANK and SILO CO.
KALAMAZOO, MICHIGAN

Savings Will Be Felt...
when you use Woodberry 887 Dryer Felts

Paper mills don't take long to discover the economies in Woodberry 887 dryer felts....

There are hours and hours of extra wear in Woodberry's patented feature — asbestos yarns woven at scientifically determined intervals into the face of these heavy duty felts. And check the savings in lowered steam consumption that results from Woodberry's high degree of porosity.

For durable reinforced dryer felts—with highly uniform contact surfaces that mean finer qualities of paper—specify Woodberry 887.

uniformity makes the big difference

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Better plan your speech now for that 1958 Dinner

Ten years can be a mighty short span in the history of a business. *Yours* for example.

When the time comes to address your fellow executives at the "Annual Banquet" in 1958, will there be a decade of outstanding company progress for you to review?

One way to make sure of a prospering business tomorrow is to make certain *today* that your employees are buying U.S. Security Bonds regularly—on the Payroll Savings Plan. The Payroll Savings Plan is a "look-ahead" plan for both management and employees. It builds up an employee group with a sense of extra security...with a tangible stake in the nation's future...a group bound to shun dollar-destroying philosophies. At maturity, the Bonds pay $4 for every $3 invested.

P.S.P. is paying off *today,* for every Security Bond dollar built up in the Treasury retires a dollar of the national debt that is potentially inflationary. Records of the companies that actively maintain the Payroll Savings Plan show improved employee attitudes. Absenteeism and accidents have dropped as the individual's feeling of security grows with regular Bond buying.

The whole plan of action for use within your company has been mapped out. Just call your Treasury Department's State Director, Savings Bond Division.

The Treasury Department acknowledges with appreciation the publication of this message by

PAPER TRADE JOURNAL

This is an official U.S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

THE MEAD SALES COMPANY
230 PARK AVENUE, NEW YORK 17, N. Y.
20 NORTH WACKER DRIVE, CHICAGO 6, ILL.

MEAD
pulp

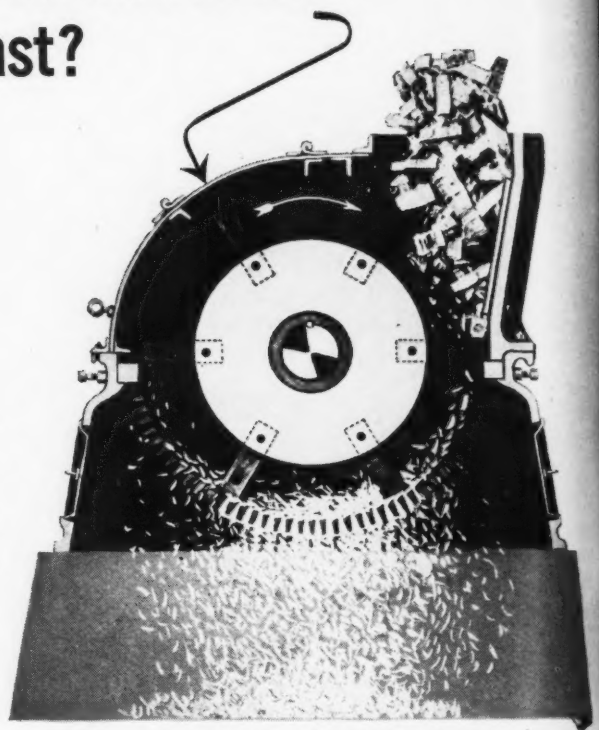
DISTRIBUTORS OF WOOD PULP
BLEACHED AND UNBLEACHED
CHEMICAL AND MECHANICAL WOOD PULP

Paul Bunyan was pretty smart, but he didn't always guess right. When giant mosquitoes made life miserable for his men, he imported some giant bumblebees from Texas to kill them off. But the two got friendly, mated, and produced offspring that had stingers at both ends. Things were worse than ever.

A reproduction of this incident from the fabulous life of Paul Bunyan—the thirty-fourth of a series—will be sent on request. It will contain no advertising.

Do your SHREDDER HAMMERS WEAR too fast?

This was the problem faced by Jeffrey Manufacturing Company ...until they found the answer in "K" Monel

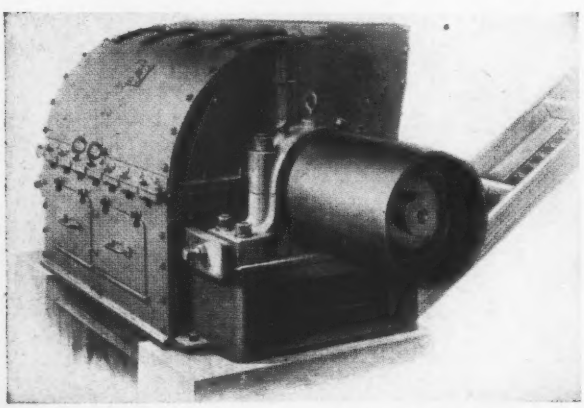


Cross-section view of Jeffrey Type E Ball Bearing Shredder, showing blades in action. "K" Monel blade tips resist both wear and corrosion by wood acids.

Jeffrey had a problem, troublesome to some pulp mill users of the Swing Hammer Shredders. Hardened steel hammer tips not only wore much too fast... but they suffered corrosion as well. When hammer tips had to be reground frequently as a result of wear and corrosion, valuable operating time was taken up.

So Jeffrey asked Inco: "Can you recommend a nickel alloy which will wear better than hardened steel, and will resist the corrosive action of wood acids in wet pulps as well?"

Inco engineers suggested tipping the hammers with "K"* Monel. The heat treated "K" Monel bars now used for tips on the Swing Hammer Shredder have high tensile and yield strengths, as well as increased toughness. Today, in the pulp mill, Jeffrey Swing Hammer Shredders with "K" Monel tips deliver many times increased life with negligible maintenance or replacement. "K" Monel, of course, provides all of Monel's well-known resistance to corrosion.



Jeffrey Type E Swing Hammer Shredder with pulley drive.

Are you faced with problems of metal wear or corrosion? Or, are you troubled with frequent shutdowns for replacement or wear of machine parts? Whatever your particular headache, Inco engineers can suggest answers on the basis of wide experience in many process industries... answers that are based on metallurgical research, sound engineering practice and a wealth of experience. On such problems as you may have, write directly to Inco.

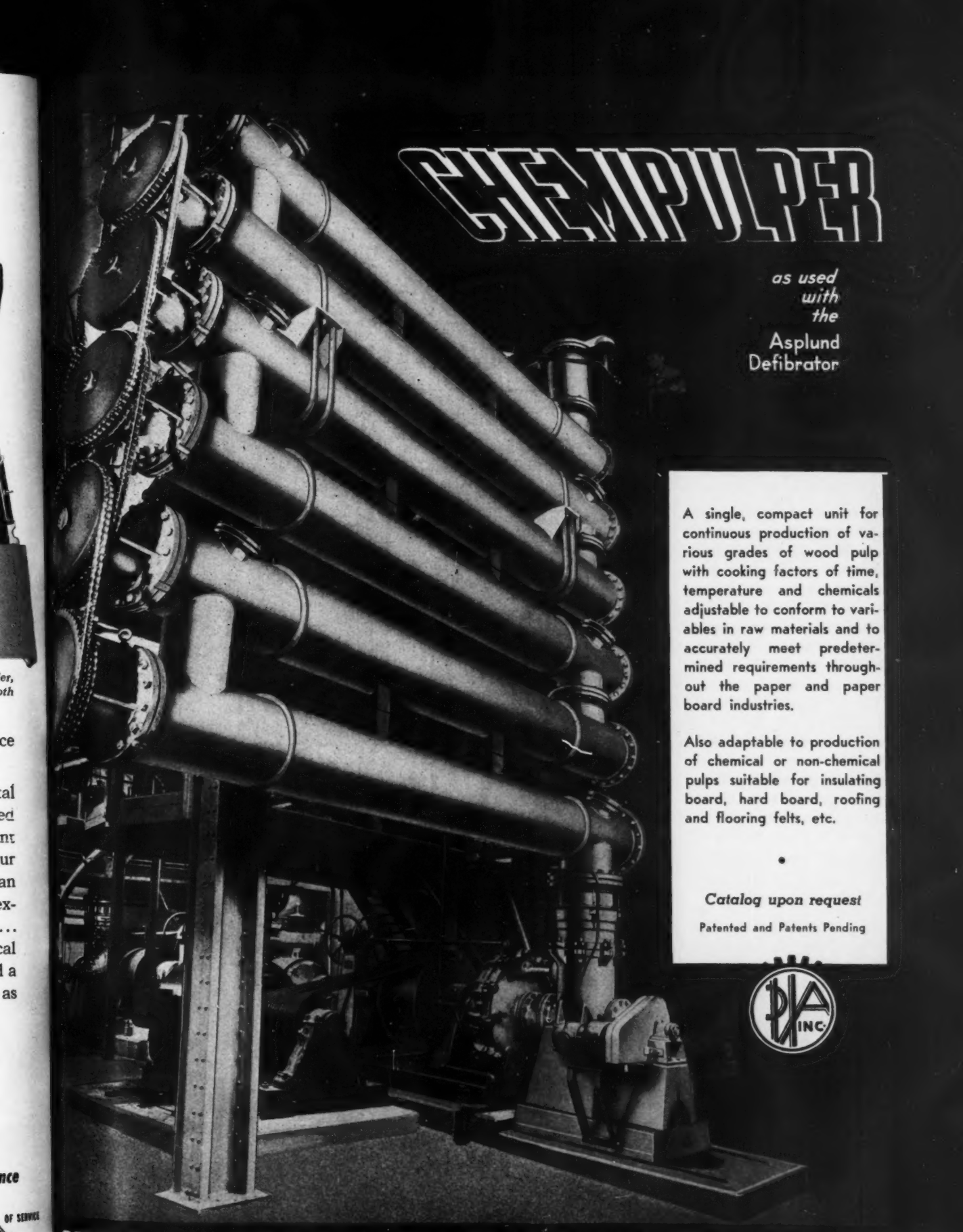
For description and prices of Jeffrey PULP SHREDDERS, write to Jeffrey Manufacturing Company, Columbus, O.

MONEL... *for Minimum Maintenance*

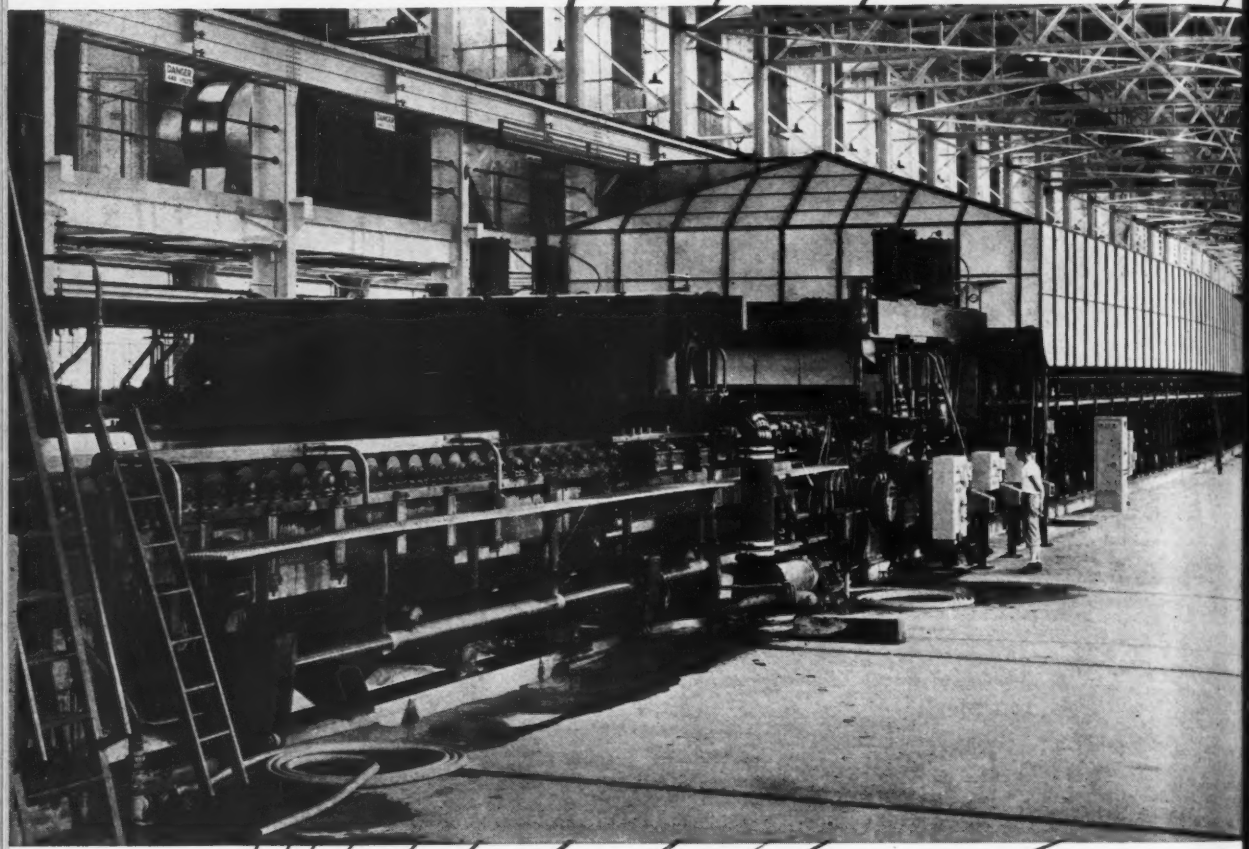
THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

EMBLEM OF SERVICE INCO TRADE MARK

*Reg. U. S. Pat. Off.


CHEMPULPER
as used with the
Asplund Defibrator
A single, compact unit for continuous production of various grades of wood pulp with cooking factors of time, temperature and chemicals adjustable to conform to variables in raw materials and to accurately meet predetermined requirements throughout the paper and paper board industries.
Also adaptable to production of chemical or non-chemical pulps suitable for insulating board, hard board, roofing and flooring felts, etc.
Catalog upon request
Patented and Patents Pending
PIA INC.
APER and INDUSTRIAL APPLIANCES, INC
2 EAST 42 STREET • NEW YORK 17, N. Y.

Largest Kraft Fourdrinier Liner Board Machine



We are proud to have collaborated with Southern Paperboard Corporation in connection with their expansion southward. It was our privilege to build for this great organization the largest Kraft Fourdrinier Liner Board Machine for their new plant at Port Wentworth, Georgia.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

Paper TRADE JOURNAL

VOL. 127, NO. 11 REG. U.S. PAT. OFF. SEPTEMBER 9, 1948

Mill Inventories of Paper

PERCENT OF INVENTORIES
(End of Year)
TO SALES
(Annual Basis)

	Dollars*	Tonnage
1934	7.8	7.2
1935	8.0	7.4
1936	7.9	7.0
1937	9.3	8.3
1938	10.0	9.2
1939	6.9	6.0
1940	7.6	6.7
1941	4.0	3.7
1942	5.1	4.8
1943	3.0	3.0
1944	2.9	2.8
1945	3.7	3.3
1946	2.8	2.5
1947	2.8	2.5
June 1948	2.9	2.5

*In determining the value of inventories, the tonnage in each group A to E has been multiplied by the average value per ton for the year. The sales and tonnage data are taken direct from group data A to E in the Statistical Summary for the period.

Has the distribution of paper been modified since the 1930's? The mills are no longer carrying the same volume of stocks of finished paper. Have the paper merchant and the paper converter resumed the stock carrying function which until the 1930's was normally theirs? During the 1930's the keen competition of the mills and the growth of the motor freight industry tended to put the paper mills in the position of carrying larger and more varied stocks of paper for prompt shipment. Some mills complained at the time that they were performing the paper merchant's stock carrying function.

Wartime shortages forced heavy reductions in the tonnage carried in stock at paper mills. The chart shows these tonnage reductions to be about half the 1937-1938 peak inventories. Three peaks are to be noted in the tonnage curve, namely, 1937-1938, 1940, and 1942. The booms in 1939 and 1941 were responsible for reductions in inventory volume at the mills. Each of these reductions was offset by a peak the following year. When real wartime shortages began in 1943, mill inventory volume was reduced to a minimum, at which level it has persisted up to June 1948.

Will it be necessary for the mills to return inventory tonnage to the 1938 peak level? While there has been a slight tendency for this volume to increase, the ratio of tonnage in inventory to tonnage sold is practically at an all time low. The same can be said of the dollar value in inventories. Both ratios are shown in the accompanying table.

It is obvious that a much greater sales tonnage is being handled on a much lower inventory tonnage than before the war. Even with a much easier market situation than has prevailed, it would seem that one wartime lesson can be learned from this analysis, namely, that a much higher volume of mill sales can be handled on a much lower inventory of finished paper than was customary during the 1930's.

Another aspect of mill inventories of paper is the amount of capital required to carry them. An inspection of the value line on the chart shows that the value of these inventories at the end of June was greater than the peak value of 1937 and 1938. Of course the answer is the higher value per ton. But should the tonnage return to the 1937-1938 level at the current value per ton, it would require more than $40,000,000 increase in the capital tied up in finished paper inventories. Further, if mill inventories of paper were to be increased to one tenth of the sales volume, (the same relationship to sales as in 1938) $187,000,000 would be required to finance these inventories. As compared with the current inventory dollar volume of $54,000,000 this would mean an increase of $133,000,000 in capital requirements for inventory.

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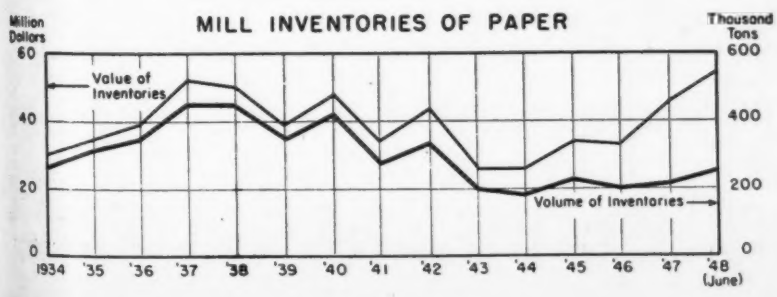


Su'pts. to Meet at Merrill, Wis.

The Northwestern Division of the American Pulp & Paper Mill Superintendents Ass'n. will hold its fall meeting September 24-25, at Merrill, Wis. Fred C. Damp of the Ward Paper Co. of Merrill is convention chairman.

Registration opens at 9:30 a.m. on September 24 at the Badger Hotel. A joint luncheon is scheduled for 12 o'clock noon the same day. Speaker at the luncheon will be M. N. Taylor of "Trees for Tomorrow, Inc."

Several professional meetings are scheduled for the afternoon, with L. S. Sabatke of the Marathon Corp. as general chairman. Meetings tentatively arranged include: Power, Sulphite Pulping, and an Open Forum.

Mace Harris of the Northwest Paper Co. is to preside as chairman of the Open Forum. This meeting is to continue with the pitch discussions which were started at the Northwestern Division meeting at Green Bay in June as well as to take up such other problems as seem pertinent.

An affiliates party, a joint dinner party, and bowling complete the program of the first day.

Program for September 25 includes visits to industries and sight-seeing, a business meeting at 10 a.m., both a ladies' luncheon and a men's luncheon, a ladies' bridge tournament, golf, and a dinner dance.

All room reservations should be made direct with the Badger Hotel.

Connecticut River Question Assumes New Aspects

HOLYOKE, Mass.—New Developments came fast and furious over the August 28-30 weekend in the paper manufacturers' fight to retain their indentured power rights here, as the recently-created Connecticut Valley Development Committee, headed by George W. McCarthy, a former alderman of Northampton, proposed a bill to be introduced in Congress calling for a Connecticut Valley Authority, patterned after the TVA for development of the Connecticut River.

"The Connecticut Valley Authority to be created," Mr. McCarthy said, "would be authorized to undertake 'the unified control and utilization of the waters of the Connecticut River system which will reconcile and harmonize the requirements for flood control, navigation, agricultural purposes, power, recreation and other needs in such a way as to secure the maximum public benefit for the region and the nation.'"

Immediate and varied reaction was reported in the area. Former State Representative John J. Riordan asserted that "cheap water power can prove a boon to the industries in this area," and gave wholehearted support to the plan.

Spokesmen for one of the disputants, the Municipal Gas & Electric Department, asserted that it approved the plan. The department said it "definitely favored the creation of an authority, fashioned after the TVA but not financed through federal funds."

Robert E. Barrett, president of the Holyoke Power Co., declined comment on the move for the present.

Coincidental with the appeal for establishment of the federal authority on the river came the formal filing with the Federal Power Commission of the Holyoke Water Power Co.'s bid for a license for a $3,974,600 hydro-electric project on the Connecticut here.

The application threw more light on the company's plans—plans which apparently will protect the city's biggest single industry, the paper manufacturers.

F. J. HOOD
elected president of Ansul Chemical Co., Marinette, Wis., is succeeding Harvey V. Higley, who has been named chairman of the board of director.

The project, to include a new power plant as well as certain existing hydraulic facilities for which a license was previously requested, would be built near Chicopee and South Hadley.

The company also asked permission to withdraw a previous application. The new power plant would have an initial installation of 60,000 kilowatts. Initial construction would include the head works structure for a second 15,000 kilowatt unit, and a tailrace adequate for 15,000 kilowatt units.

The company said it would release water through the new plant and existing installations on the canal system according to the relative efficiencies of the installations.

With a river flow of 4,500 cubic feet a second, the initial unit and existing installations would produce 17,000 kilowatts of power.

Western SAPI's Schedule

CHICAGO — The September 13 meeting of the Western Division of the Salesmens Ass'n. of the Paper Industry at Hotel Sherman will be for members only.

Explaining its plans, the group made the following statement: "In order that all Western members may find it easier to know on what date open meetings and closed meetnigs are held, open meetings will be scheduled on the second and fourth Monday of each month, beginning October 1. All other meetings will be closed. The only open meeting during September will be on September 20.

"Western members have decided not to meet this year with the Quarterback Club as they have in the past. It is the feeling of the members that a lapse of two months without any regular meetings at this time would be very injurious. Consequently, the customary schedule of meetings at the Hotel Sherman eac'i Monday will be maintained with open meetings on the second and fourth Mondays and closed meetings on the other Mondays."

Czech Newsprint Use Cut

WASHINGTON — Czechoslovakia's newsprint consumption is being curtailed by Government order, to permit larger quantities to be made available for export, the United States Government has been advised.

A reduction of ten pages per week has been ordered in size of daily newspapers, and Sunday papers will be allowed a maximum of 12 pages. Weekday editions will be limited under the order to 2 four-page editions and 3 six-page editions.

Paper industry output in the country in the first four months of 1948 included 91,512 metric tons of paper, 25,834 tons of paperboard, and 82,987 tons of chemical pulp. A new sawmill is reported in the planning stage, for production of chemical pulp from hardwood.

Eastern SAPIs Resume

NEW YORK—The first fall meeting of the Eastern Division of the Salesmens Ass'n. of the Paper Industry will be held at Midston House on September 20.

Mando Files Under Forest Law

Applications to place 20,173 acres of land under auxiliary forest contract have been filed by the Minnesota & Ontario Paper Co., Donald D. Davis, president, told *Paper Trade Journal* this week.

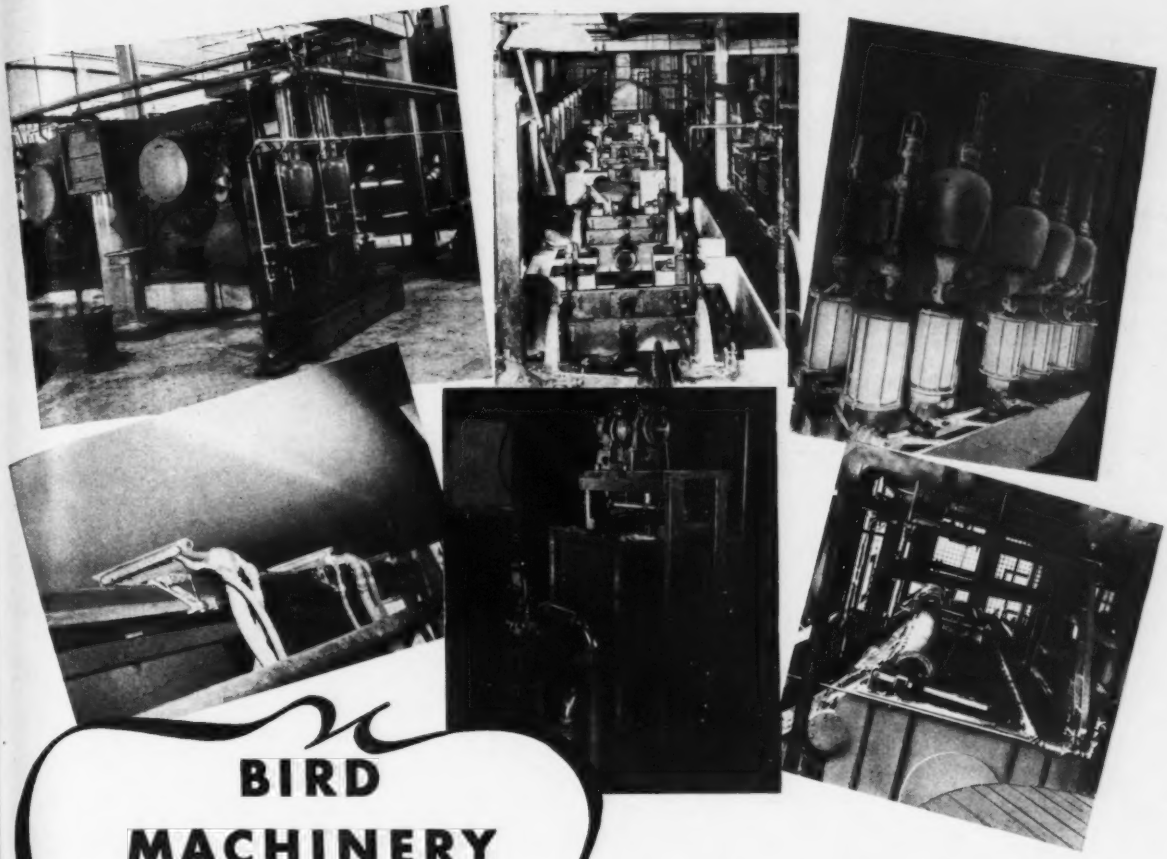
If the applications are approved, it will be the largest tract of forest land ever placed under the provisions of the Auxiliary Forest Law, established in 1927. It wil also increase Mando's holdings under the law, approved or pending, to 125,497 acres.

The area involved is part of the company's land holdings on the Kabetogama Peninsula in St. Louis county on the Canadian border, 15 miles east of International Falls.

The company purchased 49,000 acres, comprising most of the Kabetogama Peninsula area in 1942. After its purchase, these holdings were offered to the state on an exchange basis for other state-owned land. Later, the company withdrew its offer owing to the development of a long-range forest management program which included this area.

According to Mr. Davis, Mando has previously placed 17,000 acres of this peninsular tract under the law and plans to make future application for the remaining acreage. In spite of the fact that a majority of the land is presently in small timber, stated Mr. Davis, some of the land has mature timber and wil be logged on a limited scale within the next few years.

Under the law the company will enter into a 50-year renewable contract which encourages tree growing by taxing on a yield basis rather than a levy on the value of the standing timber. A small tax per acre is levied; however, the main tax is derived when the merchantable timber is cut. To insure perpetuation of the forests under this classification, provisions of the law stipulate that timber maturing after the date of the contract be cut in accordance with regulations established by the Commissioner of Conservation.



BIRD MACHINERY

Makes Many Significant Contributions To MILL EQUIPMENT In Recent Months

BIRD SCREENS have been going in by the score to keep pace with the industry's expanding production. Big, modern Bird Screens provide clean, well individualized fibres to the limit of paper machine capacity. "Drop-offs" no longer curtail production. *Bird Oscillating Shower Pipes* are increasing screening effectiveness with big reduction in volume of shower water.

JONSSON SCREENS have been making a tremendous improvement in quality pulp production, as knotters for all kinds of pulp including black liquor stock ahead of the washers. They have also proved ideal for screening straw stocks and for waste paper and deinked stocks.

DIRTECS are being adopted by a great number and variety of mills for removing heavy and fine dirt both ahead of the Bird Screens and as screen tailings units. Their flexibility.and dirt removal efficiency and economy have won them high priority on many a mill equipment program.

BIRD CONSISTENCY REGULATORS are being utilized in rapidly increasing numbers as a dependable, positive and economical step towards quality control.

BIRD SAVE-ALLS are being increasingly relied upon to conserve costly fibres at lowest net cost per pound recovered.

VICKERY FELT CONDITIONERS are proving more than ever essential as machine speeds increase because they assure maximum output through continuous operation without mid-week shutdowns for felt washings.

VICKERY DOCTORS are being applied more extensively than ever because continuously clean, shining rolls have such an important bearing on quality and reduction in rejects.

For information, layouts and estimates on any or all items of Bird Machinery, get in touch with

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

Thirty-Fifth Conference with Hammermill Agents

A record attendance of 197 paper merchants at the 35th Conference with Hammermill Agents heard plans for merchandising the increased production of Hammermill papers. Paper distribution executives from all sections of the United States, from Cuba and from the Philippines were present at the Erie, Pa., meeting August 24-27.

Following the opening business session on August 25, the visiting paper merchants toured the Hammermill plant.

Bruce Barton, author and executive in the firm of Batten, Barton, Durstine & Osborn, Hammermill's advertising counsel, was guest speaker at the Fiftieth Anniversary Dinner, held at the Lawrence Hotel, Erie, on the evening of August 25. During this banquet the agents presented a deluxe desk set to Hammermill in honor of its 50th anniversary. Dr. Otto F. Behrend, Hammermill co-founder and present treasurer, was presented with a testimonial honoring his 50 years of service to the mill. On behalf of the agents, Ralph G. Luff, president of the D. L. Ward Co., Philadelphia, Pa., and retiring chairman of the advisory committee, presented an engraved wrist watch to Harrison R. Baldwin, for many years Hammermill vice-president in charge of sales. Mr. Baldwin's retirement becomes effective January 1, 1949.

After the August 25 meetings, the conference moved to the Kahkwa Club in Erie where business sessions were held on August 26-27. Speakers at these meetings included Donald S. Leslie, Hammermill's first vice-president and general manager; John D. Zink, vice-president and director of merchandising; Grant Richardson, manager of sales; A. Ellis Frampton, manager of advertising and sales development; Mortimer E. Graham, company secretary, and Harrison R. Baldwin.

Prior to the general business sessions, members of the Agents' Advisory Committee met with mill officials on August 24 at Weigelia Lodge, Mr. Wilson's country home, for a discussion of the Conference program. Committee members present were: Ralph G. Luff, chairman; H. T. Newell, Sr., of the Jackson Paper Co., Jackson, Miss.; Dewey A. Hoadley of the Carpenter Paper Co., Omaha; L. V. Mulnix of the Carpenter Paper Co., Grand Rapids; Eric A. Rohrer of the Swigart Paper Co., Chicago; Frank H. Winter of the Carter, Rice & Co., Corp., Boston; Hugh G. Boyer of the Caskie Paper Co., Inc., Charlotte, N. C.; C. W. Stuyvesant, of the Alling & Cory Co., New York; C. S. Lafferty of the Beacon Paper Company, St. Louis; and Allan R. Newmark of the Zellerbach Paper Co., San Francisco.

The assembled agents elected the following to serve three-year terms on the advisory committee: Charles H. Williams, Clements Paper Co., Nashville; E. L. Walters, Western Newspaper Union, Omaha; C. Raymond Smith of the Garrett-Buchanan Co., Reading, Pa. Eric A. Rohrer of the Swigart Paper Co., Chicago, was elected chairman for the next year.

Elected for three-year terms on the paper committee were: S. B. Gaines of the Capital City Paper Co., Springfield, Ill.; Donald Holmes of the Dudley Paper Co., Lansing, Mich.; and John D. Williams of the D. L. Ward Company.

The final two afternons of the conference were devoted to golf and other games. In this competition, Harold Hurst of Henry Lindenmeyr & Sons, Newark, N. J., won the Ernst R. Behrend Golf Trophy to take possession of the silver bowl for the coming year.

Other prize-winners of the two days included: Golf: No. 1 Division, low gross, Donald Holmes and Courtney H. Reeves; low net, T. J. Thumser and E. J. Petrequin; second low net, Kirby G. Cook and E. E. Cole. No. 2 Division, low gross, J. H. Schneider and Frank P. Leslie; low net, Harold Hurst and Lester L. Nickels; second low net, J. C. Marvin and E. L. Kramer, Kickers' Handicap, R. E. Estes and A. M. Miller. Pitch-'N-Putt, low gross, A. A. Baron and D. Kipp Conover; second low gross, A. Robert Patchen and S. B. Gaines.

Monte Carlo: First prize, Stuart H. Richeson and E. A. Phipps; second prize, Amadeo Ferrer and W. G. Landers. The Selling Game: First prize, G. A. Naumann and F. Earle Windows; second prize, Edward Sylvander and G. Taylor Sykes. Dart Bowl: First prize, Albert Carus and Z. D. Milledge; second prize, Milton D. Bradford and Ernest C. Mead. Bowling Blocks: First prize, Thomas R. White and J. M. H. Fitzgerald; second prize, Ralph G. Luff and W. Predmore.

ECA Machinery for Norway

WASHINGTON — Machinery for Norway's pulp and paper industry, costing $63,000, was included in authorizations under the ECA program announced August 31.

The equipment, to be purchased in the United States, includes four guillotines, a tube winder, embossing rollers, four paper cutters, and one folding apparatus, it was stated at ECA headquarters.

Federation Sparks Speculations

TORONTO, Ont.—The decision of the voters of Newfoundland to throw their lot in with Canada by becoming the tenth province of the Dominion, has stirred speculation as to the results, if and when federation is consummated.

Financial Counsel figures that by 1949, with the entry of Newfoundland into the Dominion, Canada will produce 60 percent of the world supply of newsprint.

Newfoundland at present produces about 435,000 tons per annum, and with expansion now proceeding, says the report, a total annual capacity of about 480,000 tons is expected in 1949. This will be between ten and 11 percent of Canada's total.

United Kingdom Pulpwood Stocks

WASHINGTON—The United Kingdom began this year with pulpwood stocks totaling 146,600 long tons as of February, the Department of Commerce reports.

However, the department adds, based on American reports from the United Kingdom, stocks of woodpulp for paper making, and stocks of newsprint, were considerably less in February, 1948, than in the previous August, amounting to 115,400 tons of papermaking pulp in February against 174,600 tons in August, 1947, and 111,600 tons of newsprint, compared with August, 1947, stocks of 152,600 tons.

Straw Test Run This Month

HOLYOKE, Mass. — Newsprint made from a specially-prepared wheat straw will be run off on a machine of the Chemical Paper Mfg., Co., of this city sometime in September, working with the Kinsley Chemical Co., of Cleveland, Ohio, which has developed the process. The wheat straw is to be treated with the Kinsley chemical product. The paper will be 100 percent straw and is expected to be four times as strong as conventional newsprint. Those who have been working on the process hope it can be made for $70 a ton.

Paper Yarn Tests Encouraging

LUDLOW, Mass.—Ludlow Mfg., Co., manufacturer of jute, hemp and flax yarns, twines and bagging, has been experimenting with paper yarn and reports excellent results, it is disclosed. Samples have been tested by various prospective users, particularly in the carpet field, it is said. A Ludlow official, who declined to estimate how important a factor the paper product might become as a substitute for jute, points out that the price of jute, and other competitive factors, make prediction impractical.

Blank Book Employes' Dinner

HOLYOKE, Mass. — Two hundred members of the National Blank Book Co.'s Social and Athletic Club, gathered at Toto's Restaurant Aug. 30 for their seventh annual mid-summer party. In charge of arrangements for the affair was Arthur Gendron, chairman.

DU PONT GREENS
FOR PAPERS
Du Pont Brilliant Green Crystals
Du Pont Naphthol Green B Extra Conc. 125%
Du Pont Victoria Green Small Crystals
Monastral* Fast Green GWD (Pat.)
Pontacyl* Green BL Extra Conc. 200%
Pontacyl* Green NV Extra Conc. 200%
Pontacyl* Green SN Extra
Pontamine* Brilliant Green GX
Pontamine* Green BXN Conc. 150%
Pontamine* Green GX Conc. 125%
These versatile greens may be used as self-shades, and also in mixtures drawing on the wide range of colors from Du Pont standard lines of dyestuffs.
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What are your specific requirements as to shade . . . fastness . . . application method . . . furnish . . . cost? Whatever your problem may be, there's a Du Pont color which will suit your needs. Our Technical Staff is always ready to assist you. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.
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China Looking Up, Paperwise

WASHINGTON—A steady gain in value of pulp and paper imported into China is indicated by latest figures reported here, covering the earlier months of this year. These figures showed in May, imports valued at $2,752,444; April, $2,592,667, and March, $1,922,463.

Plans have been under way for some time in that country, for establishment of a modern pulp mill near Foochow, Fukien Province, it is reported, to be jointly financed by United States and Chinese interests, at a cost of about $20,000,000 (U. S. currency).

Prior to the spread of the recent war, Japanese occupation authorities had planned such a mill in that area which would have been one of the largest in the Far East. Meanwhile, it is anticipated that the Chinese will recover some time this year, the paper mill, valued at $3,000,000, formerly located at Canton, which had a 50-ton paper capacity, and which was a war casualty. It is to be re-erected near Canton after it is returned from Hokkaido, Japan, where it was found.

Paper and paperboard plants operated by the Chinese National Resources Commission last year produced 15,190 metric tons of paper and board, or more than three times the 1946 output. The 1947 production of these mills was said to represent about 20 percent of all Chinese production for the year.

The Philippines constitute a substantial U. S. market by Far Eastern standards, the islands in 1947 taking imports of 12,072 kilograms (2.2 pounds) from this country, out of total imports of newsprint amounting to 17,526 kilograms; other printing paper, 1,298 kilograms out of total imports of 1,330, cigarette paper, 172 kilograms out of 314, besides various quantities of crepe and tissue, toilet paper, paper towels and napkins, kraft wrapping, other wrapping paper, old newspapers for wrapping and packing, and paper bags.

The Philippines imported 41,360,000 pounds of wallboard from the United States last year and about the same quantity of paperboard.

First quarter imports of paper and paper manufactures into Madagascar, this year were 197 tons, while, for other Far Eastern parts, war conditions have had varying effects. Paper imports into Java, Netherlands Indies, have been cut to about 50 percent of pre-war, and less than 25 percent of the 1940 level, or about 20,100 tons, with domestic paper production placed at about 6,338 tons.

A recent report from Burma indicates an effort being made to increase salt, sulfuric acid and caustic soda, besides a chlorine plant, in conjunction with operation of a paper factory.

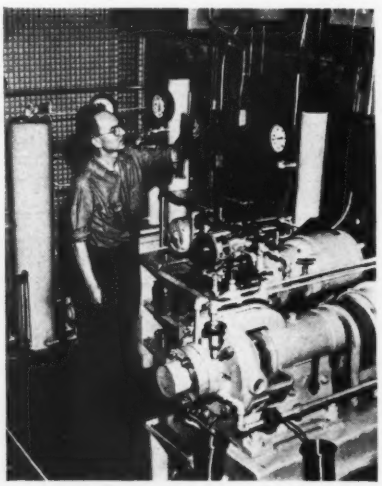
St. Lawrence Projects Urged

BOSTON, Mass—New England paper manufacturers learned on August 31 that Gov. Thomas E. Dewey of New York has called upon the federal government for quick action on his proposed $400,000,000 St. Lawrence River power project. At the same time he came out again in favor of the St. Lawrence Seaway plan endorsed by New England papermakers on the ground that it would mean increased transportation facilities, and might result in lower freight rates.

Gov. Dewey told the Federal Power Commission that the need for power was "urgent and vital to the economic development of the region affected by the St. Lawrence, as well as of utmost significance to the national defense." He urged that the application be "processed without delay and only with the reservation that nothing be done that will hamper the fullest development of the seaway."

The Federal Power Commission, in a letter to the governor, said the state power authority's application has been forwarded to the International Joint Commission which must approve water projects affecting Canada and the United States.

It has been estimated the power development would cost from $390,000,000 to $428,000,000, with New York State and the Canadian province sharing costs.



SEAL TESTING

In the mechanical seal experimental and testing lab operated by the Pump Division of the Byron Jackson Co., of Los Angeles, mechanical seal experimental runs as well as routine tests of seals prior to installation, are made under the supervision of Wes Shone, inspector. Testers have been so designed that all seal sizes from one inch to 4½ inches can be assembled and run. Each seal face is lapped, inspected under a flat, and installed in a tester. Seal oil pressure is supplied by an automatic pressure system capable of operations between 0 and 1,000 psi. Isolating tanks connected to this system, permit testing with water as well as special lubricants, with the same range of pressures. Cooling jacket water is supplied by the BJ Bilt-on pump. Flow indicators are located in each cooling jacket line. Leakage is recorded, together with the length of the run, seal oil temperature, and information describing the type of seal under test.

San-A-Pak Contract Signed

HOLYOKE, Mass.—Climaxing negotiation that have extended over seven weeks, the bargaining committee representing employes of the Mount Tom division of the San-A-Pak Corp., on August 30 signed a new contract with management. Employes, numbering about 150, are members of Local 578 of the International Brotherhood of Papermakers.

Salient points of the new pact include a 12-cent-an-hour general wage increase, a step-up in vacation arrangements, and a wage differential hike from three and five cents, to four and six cents for the second and third shifts, respectively. The agreement is retroactive to July 1, the date on which negotiations began.

Hammermill Production Dept.

ERIE, Pa.—D. S. Leslie, general manager of the Hammermill Paper Co., reports that a new production department has been created to expedite paper deliveries to merchants. At the same time Director of Merchandising J. D. Zink disclosed that George Smart has been named district sales manager of the eastern territory, with headquarters in New York. John Frazen, former manager of the New York office, is moving to Erie as manager of sales research, a new department within the Hammermill merchandising organization.

Paper Ribbon Filling

PHILADELPHIA — Introduction of a new ribbon filling to be known as Textilene No. 12 was disclosed on August 30 by E. W. Twitchell, Inc., manufacturer of industrial paper products.

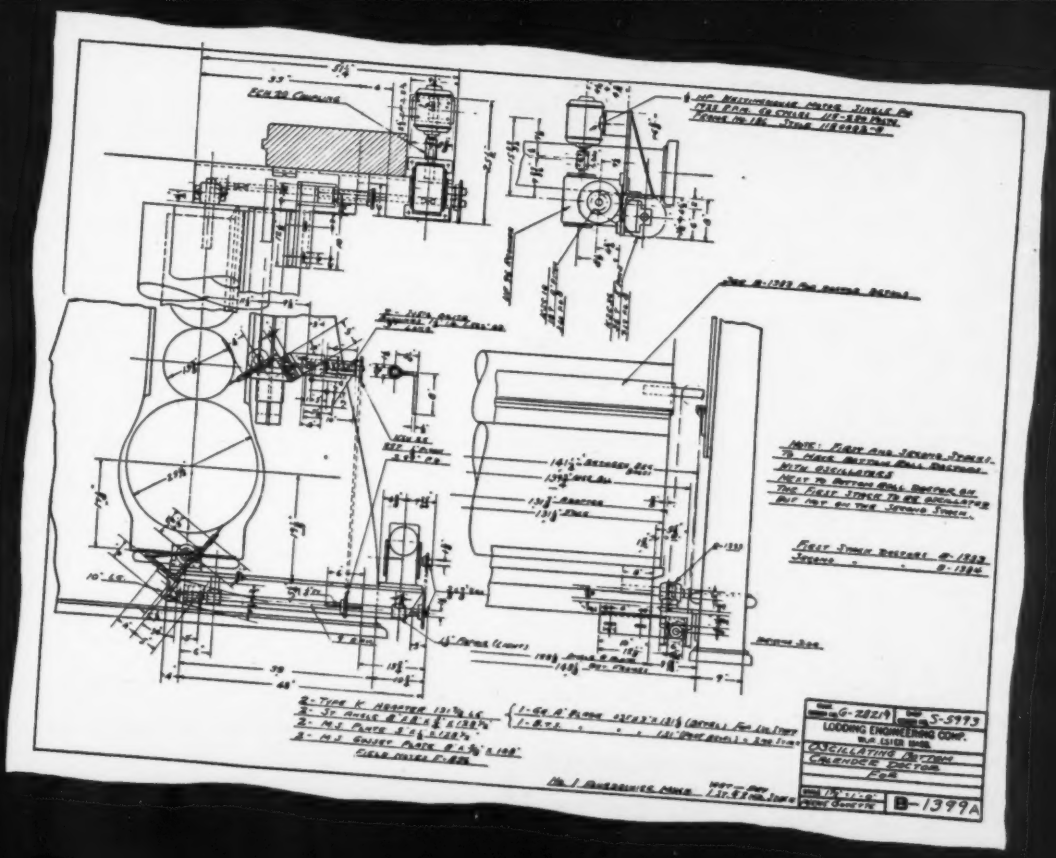
Described as the thinnest yarn made by the firm, it will be produced for use as filling for carpets, tapestries, velvets and other types of floor coverings. Running from 1,200 to 1,250 yards per pound, the new yarn is said to be 30 percent longer than the Twitchell No. 16 yarn which has been on the market as a carpet filler.

Gets Parsons Franchise

NEW YORK — Advertisers Paper Corp., has been awarded a franchise for Parsons Paper Co. mill brand lines of fine cotton content bonds ledgers and index bristols.

Sheehan Heads General Fibre

NEW YORK — John R. Sheehan was elected president of the General Fibre Corp., on August 31.



ENGINEERED by LODDING

Doctors are important.

You can only afford the best — *custom designed* and *built* by Lodding Engineering Corporation, Worcester, Massachusetts. Represented outside New England by W. E. Greene Corporation, Woolworth Building, New York.

Macon Kraft Co. Pioneering New Odor Elimination Process

MACON, Ga.—According to a joint announcement by the Citizens Committee Against Pollution and Macon Kraft officials, "definite strides are being made toward the elimination of objectionable odors from the Macon Kraft Co. paper mill."

Company officials, meeting with representatives of the committee, announced that new equipment will be installed at the mill to eliminate the largest portion of the odors.

Al H. Mahrt, president of the Macon Kraft Co., said the new process for odor elimination was developed after 19 months of research at the Ohio State University Research Foundation.

"Tests show that the new equipment should eliminate objectionable odors from three of the four sources," he continued. "It has never been tried before, however, and in all fairness we cannot say positively that it will accomplish everything we desire when put to practical operation.

"From what has been established in laboratory and research tests we believe it to be the biggest step forward made so far in the elimination of the gaseous odors."

The conference was called by Solicitor General Charles H. Garrett to receive reports from the paper company's engineers who visited a reported "odorless" paper mill in Houston, Tex., a few days ago.

New St. Louis Converting Plant

ST. LOUIS—Commercial Tube & Can Corp., has begun operation of its local plant to manufacture small and large, lightweight and heavyweight paper mill cores, mailing tubes and paper-end cans, Barney Fisher, president, informs *Paper Trade Journal*. Frank E. Waleba is plant superintendent. He was formerly with the R-C Can Co.

Flintkote's Walker Speaker

NEW YORK—L. Rohe Walker, public relations director of the Flintkote Co., is programmed to speak at the industrial section meeting of the Direct Mail Advertising Ass'n. during that group's annual conference and exposition at the Benjamin Franklin Hotel, Philadelphia, September 29-October 1.

Herbert Incorporates

BUFFALO, N. Y.—Herbert Paper Specialties, Inc., has been incorporated here with capital of $100,000. Incorporators are Joseph A. Albrecht, Frank J. Maguire and Ralph J. Gretg.

Metropolitan TAPPI Dinner

NEW YORK — Fraunces' Tavern has been chosen as the site of the meetings of the Metropolitan Group, TAPPI, with the first gathering of the winter season set for 6:45 PM, September 14, when E. W. Tinker, executive secretary of the American Paper & Pulp Ass'n., will be the speaker. The October meeting will be held on the 19th of that month to avoid conflict with Columbus Day. No meetings are scheduled for December or February.

Cline in New Post

WASHINGTON — Designation of Albert C. Cline, formerly director of the Harvard University Forest, Petersham, Mass., to head Forest Service studies and investigations of world forest resources and industries, was reported by the Department of Agriculture on August 30.

Gamble Estate to Widow

WATERTOWN, N. Y. — Williard S. Gamble, late president and controlling stockholder of the Brownville Board Co., left a gross estate of $415,107 plus $70,000 of untaxable life insurance. His widow is the principal beneficiary.

Eastman Advances Barr

ROCHESTER, N. Y.—William E. Barr has been appointed assistant general manager of the sensitized goods sales division of the Eastman Kodak Co.

Staley Personnel Shifts

DECATUR, Ill.—Lyle York, Buffalo district manager for the A. E. Staley Mfg. Co., industrial sales department, has been given charge also of the company's Michigan and Ohio territories. John Harris, who has been the Staley industrial sales representative in Michigan and Ohio for many years, has resigned to open his own brokerage firm in Columbus, O. He will henceforth be the Staley broker for industrial products in his area.

Mr. York, who has been living in Buffalo, will move to Cleveland. Fred Ohlen, Staley industrial products salesman who has been handling soy flour sales and general sales in part of Ohio, will continue in his present territory.

Carl Gehring, paper mill technician, who has been calling on mills in the New York and Pennsylvania area, has been shifted to an Ohio territory. He will live in Urbana, O.

Another addition to the industrial sales department is Charles E. Connor, who will work out of the Atlanta office.

Sundquist Visiting South America

NEW YORK—Karl E. Sunqvist, president of Industria, Inc., 52 Broadway, left on August 27, on the S/S "BRAZIL", on a two month trip to Brazil, Uruguay and Argentina. He will visit existing paper mills and help the company's representatives with queries the customers in those countries may have.

Patterson Opens Boston Office

EAST LIVERPOOL, Ohio—The Patterson Foundry & Machine Co. has named James H. Hood, Jr., as district manager of the company's new office at 79 Milk street, Boston, Mass., servicing New England.

Hanigan Lindenmeyr Manager

BOSTON — Ed. J. Hanigan has been named manager of the local office of Henry Lindenmeyr & Sons, paper merchant firm.

Hampshire Bond Status

HOLYOKE, Mass.—Two of the oldest rag paper manufacturing firms in the country were merged Aug. 28 when the rights to make Old Hampshire bond, made by the Hampshire Paper Co., and later by the Carew Mfg. Co., of South Hadley Falls, were sold to the Byron Weston Co., of Dalton. Byron Weston thus is also taking over such well-known paper lines as Falcon ledger, Merit bond, Lenox ledger and Lenox bond.

Old Hampshire bond was first made at the Hampshire plant in South Hadley Falls, now the Stevens Paper Co., in the early 'nineties.

Hampshire Paper Co., Inc., 541 Main street, Holyoke, will continue to convert the Old Hampshire bond, made on the Byron Weston machines, into writing paper and envelopes. This brand has been made on the Carew machines since the sale of the Hampshire Paper Co. mill in South Hadley Falls to the Stevens Paper Co., a few years ago. Byron Weston, however, will have the privilege of selling Old Hampshire bond in the flat paper to printing houses throughout the country.

Byron Weston has also acquired 200 distributors, an additional two-to-four million pounds in annual output, and approximately $400,000 worth of finished paper stock, chiefly in bond and ledger.

Completion of a new building connecting the Centennial and Defiance mills made possible the addition of the South Hadley firm's production by Byron-Weston. The new building will house the calendering and finishing departments.

Harry R. Birt, sales manager of Byron Weston, said that production of the new watermarks and brands will be transferred to the Dalton mil as soon as production schedules can be arranged and new dandy rolls made to fit the machines.

3 Superintendents O.K. Taylor Beater Roll Pressure Controls

HERE is what the superintendents of three New England paper mills say about our Taylor Beater Roll Pressure Controllers. We're especially proud of their letters—because we were first to demonstrate that it's accurate measurement and control of *beater roll pressure*—not of position or power input—that delivers top efficiency in the beating process.

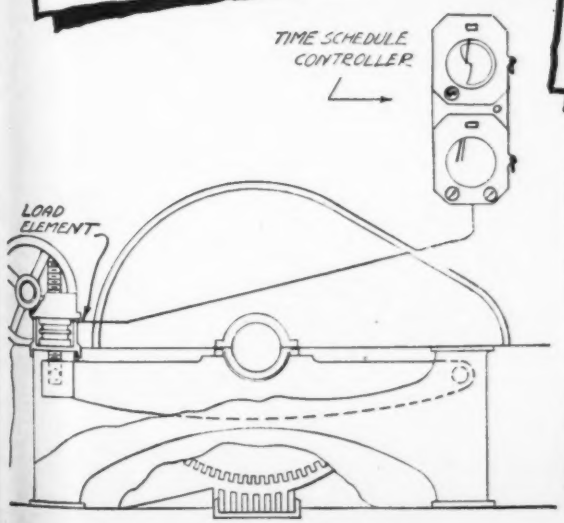
For full details of this and other money-saving control systems, call your Taylor Field Engineer or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow and liquid level.*

. . . Perhaps one of the best methods to learn what an installation of this sort will do, is to listen to the comments of the mill men themselves. I think if you could hear the remarks of our beater engineers and machine tenders, even to you they would be very gratifying. . . .

. . . A secondary value of the controls has arisen since we have been faced with problems of high production and labor shortage. Beater room workmen have their hands full just furnishing and dumping the beaters and washers, and they appreciate the advantage of being able to start the control and know that no further attention is required until the signal light goes out, showing that the time-pressure (beating) cycle has been completed. . . .

. . . There has been a tendency towards greater beating precision, which has reflected itself in better quality of stock from all furnishes. After obtaining the best beating results from any furnish it is then possible to duplicate the results obtained and this is something that was difficult to do previous to the installation of the Taylor Beater Recorders.

Furthermore men coming in on a new tour are able to duplicate the results of the preceding tour, and in starting a new run of stock the engineers have the information in front of them from the previous making as a guide. . . .



Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

Australian Notes

PERTH, W. A.—The Commonwealth Statistician has just released details of the paper manufacturing industry in Australia for the financial year 1946-47. These show that the number of mills was the same as for the previous year, namely 12, but that employes had increased from 4,705 to 5,078. Salaries and wages paid were up from £1,577,000 to £1,934,000; the cost of power, fuel, light, etc., had risen from £599,000 to £782,000; and the value of raw materials used rose from £3,802,000 to £4,057,000. Total value of output was £8,656,000 against the previous year's £7,418,000.

Materials used in pulp mills were: Wood, 269,411 tons; straw, 6,653 tons; old or waste paper, 65,412 tons; limestone, 14,975 tons; lime, 841 tons; soda ash, 229 tons; and caustic soda, 4,719 hundredweights (of 112 lb.). Production of pulp totalled 88,690 tons.

Total pulp used in paper mills amounted to 129,281 tons. Articles produced were: Newsprint, 31,734 tons; blotting paper, 854 tons; duplicating paper, 1,454 tons; printing and writing papers, 19,928 tons; wrapping and kraft papers, 26,801 tons; other various papers, 23,735 tons; other wrapping papers, 4,800 tons; straw boards, 7,876 tons; and other boards, 68,687 tons.

Imports of paper and boards for the year totalled 206,209 tons (newsprint, 163,341; other papers, 37,309; boards, 5,559).

Land and buildings were valued at £1,659,960; plant and machinery at £2,923,957; and adidtions and replacements to land and buildings cost £250,263; and to plant and machinery £803,522. Depreciation allowed on land and buildings was £61,339; and depreciation on plant and machinery was £371,774.

Imports of newsprint to Australia during the month of May were down badly to a total of 327 tons, but this was 281 tons better than the April figure. But in comparison with the May, 1937, figure there was a drop of 14,692 tons in rolls and 744 tons in sheets.

Imports of other printing papers were: (all in Australian hundredweights of 112 lb.): Imitation art, 6,992 (United Kingdom 3,409; Sweden 1,807; Netherlands 706; Belgium 440; Finland 291; Norway 239; Switzerland 100); duplex, 1,109 (all from U.K.); other coated printing papers, 3,969 (U.K. 3,328; U.S.A. 471; Finland 102; Sweden 68); glazed imitation parchment, 1,267 (Sweden 993; U. K. 175; Norway 99); lithographic, machine glazed or one side calendered, 6,065 (Norway 2,996; Sweden 1,666; Finland 1,129; U.K. 230; Austria 44); offset embossed, 10 (all U.K.); poster, machine glazed, 801 (Austria 476; U.K. 325); and other various papers, 25,559 (Norway 11,345; Sweden 8,446; U.K. 3,858; U.S.A. 720; Finland 666; Canada 321; Netherlands 203).

Total imports from the United States were down to 1,191 hundredweights.

W. Dunstan, V.C., general manager of the *Herald & Weekly Times*, Ltd., chairman of Newspaper Supplies, Ltd., and co-manager of the Newsprint Pool, has given *Newspaper News* a prophetic analysis of Australia's permissible consumption of newsprint in 1949. This is a total consumption of 90,000 tons, made up from 45,000 tons overseas imports, 30,000 tons Tasmanian mills, and 15,000 tons local reserves.

Eric Kennedy, acting joint pool manager, expects that there will be a rise in the price of newsprint. "The present provisional price of £43/10/-a ton was not increased when the New York price rose from $90 to $96 a ton," he says. "The increase was delayed because only 5,000 tons were to be imported in the first half of 1948. But the further increase, which was effective on August 1st, will bring the New York price to $100 a ton, and the two price increases, which aggregate $10 a ton, will be made effective concurrently."

Australian Paper & Pulp Co., Ltd., and Cumberland Paper Board Mills, Ltd., which own all the ordinary shares in Australian Paper Manufacturers, Ltd., are negotiating for a merger of interests. Both firms are in complete agreement that this merger is most desirable and the necessary first step towards the simplification of the structure, and in the best interests of all shareholders. Particularly is this so in view of the large expansion program ahead. Details of an agreement are be-

PAPER AND BOARD: PRODUCTION, JUNE 1948

(Tons of 2,000 pounds)

Type of Paper	June 1948	May 1948	June 1947
ALL TYPES, TOTAL	1,832,933	1,908,234	1,727,609
Paper, total	937,335	959,903	882,464
Newsprint	73,540	74,171	66,345
Groundwood printing & specialty paper, total	74,819	71,669	70,783
Printing	48,559	47,710	43,225
Converting	23,508	20,800	22,011
Other	2,752	3,159	5,547
Book paper, total	192,352	197,242	178,013
Printing	146,723	150,770	130,703
Converting	38,167	39,082	44,050
Other	7,462	7,390	3,260
Fine paper, total	102,353	103,369	101,311
Writing, total	76,492	78,678	74,025
Rag (including index)	11,257	11,446	14,715
Chemical wood pulp	65,235	67,232	59,310
Cover and text	6,981	6,062	7,629
Bristols (except rag index)	11,318	11,201	12,761
Thin	5,714	6,252	5,976
Other	1,848	1,176	920
Coarse paper, total	256,931	268,302	244,373
Glassine, greaseproof, & vegetable parchment	9,607	10,992	12,728
Wrapping, total	62,661	67,018	71,234
Unbleached kraft	29,601	31,783	30,938
Other	33,060	35,235	40,296
Bag, total	53,607	53,591	48,609
Unbleached kraft	49,355	48,622	45,492
Other	4,252	4,969	3,117
Shipping sack	63,449	64,011	50,334
Converting, total	67,607	72,690	61,468
Unbleached kraft	40,045	41,950	34,255
Other	27,562	30,740	27,213
Special industrial	23,761	23,481	23,806
Sanitary	79,026	83,282	70,907
Tissue	18,485	20,135	16,308
Absorbent	8,867	9,358	8,897
Building paper	107,201	108,894	101,721
Paperboard, total	775,776	816,296	739,476
Liners	281,787	298,045	265,861
Corrugating material	103,889	110,027	102,690
Container chip & filler board	29,512	30,893	26,053
Folding boxboard	174,079	180,864	179,591
Set-up boxboard	47,225	51,126	47,415
Cardboard	7,149	7,119	6,952
All other paperboard	132,135	138,222	110,914
Wet machine board, total	10,527	10,224	11,029
Shoe board	4,178	3,802	3,706
Binder board	3,410	3,450	3,898
Other	2,939	2,972	3,425
Building board	109,295	121,811	94,640

These data are estimated to give 100 percent coverage of the industry. The proportions of estimate are as follows: Fine paper, 3 percent; Sanitary, 8 percent; Tissue, 9 percent; Cardboard, 22 percent; Wet machine board, 12 percent; Building board, 5 percent, and All other grades of paper and paperboard, less than 3 percent. Data for June are preliminary and will be revised in the July report.

Source: U. S. Dept. of Commerce.

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HERE'S a pigment with very high coloring power, which is very economical for coloring paper in the beater. It's Du Pont Soluble Blue PB-6-D—a form of Iron Blue—so processed as to give quick and complete dispersion in water.

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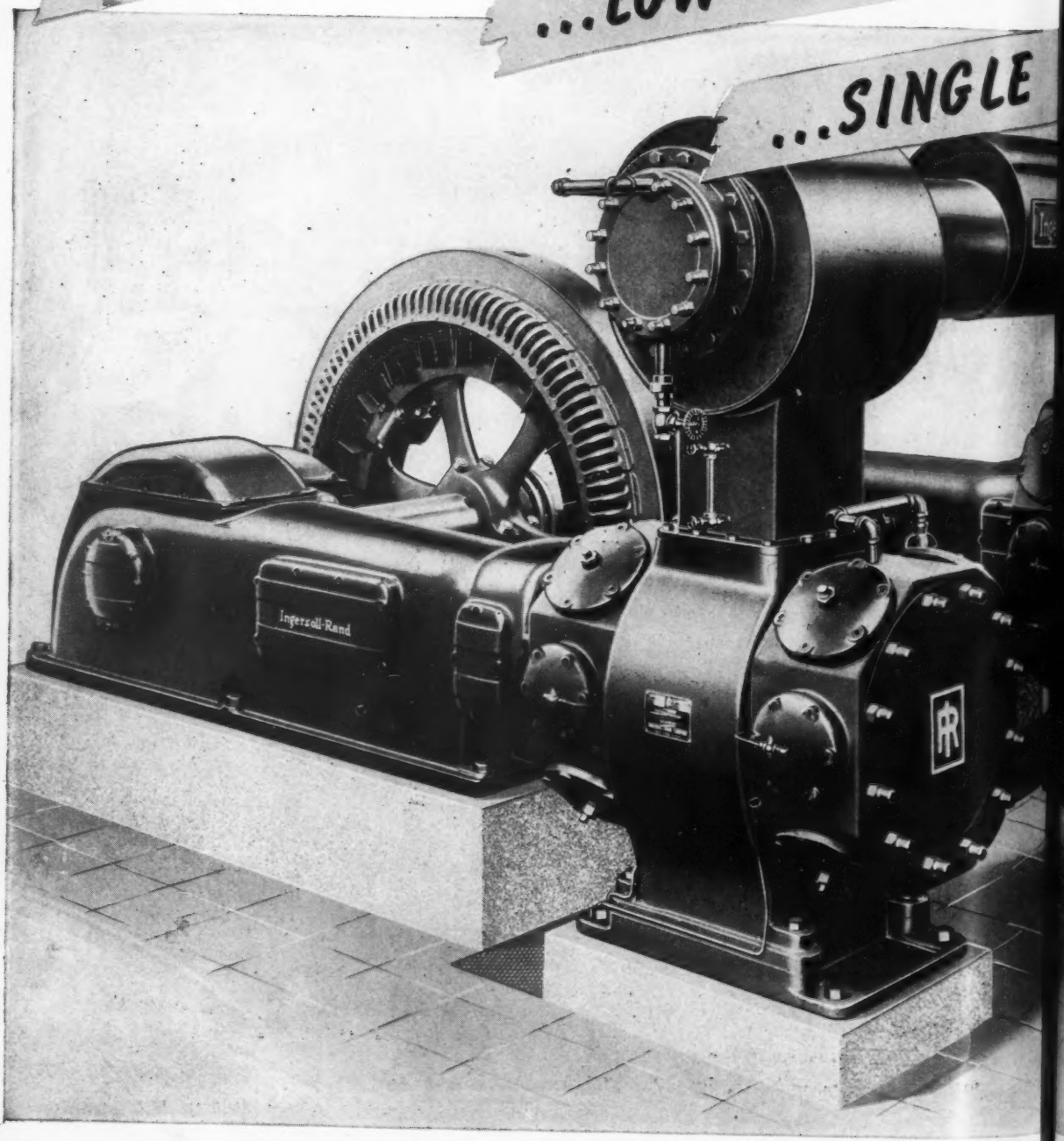

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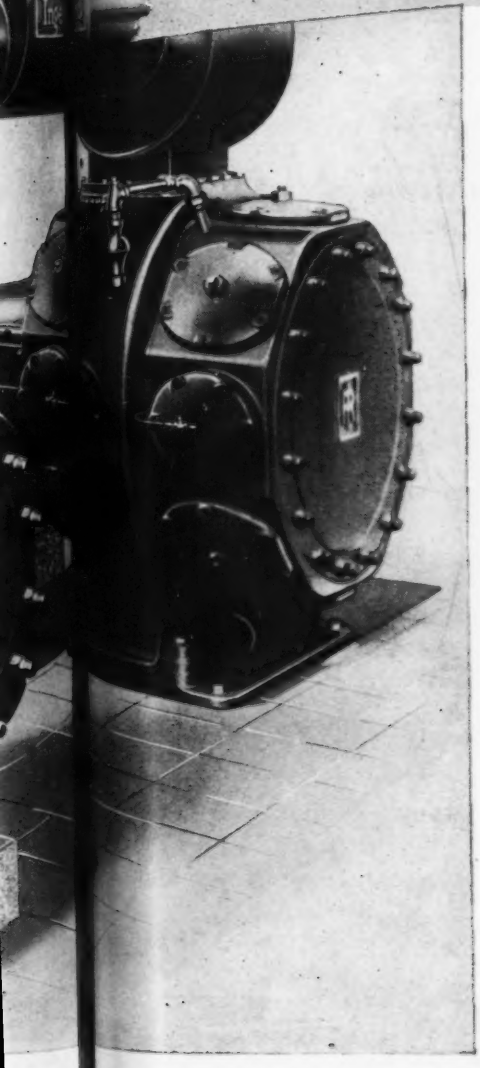

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ing worked out, and it is expected that a full announcement will be made shortly.

Three representatives of Thomas Owen & Co., of Cardiff, are at present in Australia making preliminary arrangements for the design and lay-out of the paper making plants at Ballarat (Victoria) and at Burnie (Tasmania). These representatives are H. Thomson, of Hitchens, Jarvis & Partners, consulting engineers to Thomas Owen & Co.; T. Webster, chief engineer of Owen & Co.; and A. Mathias, chief draughtsman of the company.

T. Bruce Fallows, who represents a Canadian group of six paper mills, is at present in Australia negotiating with the Australian Newsprint Supply Co., for the adjustment of a ten-year contract for the supply of paper.

Controllers Institute Elects

NEW YORK — Robert N. Wallis, assistant treasurer of the Dennison Mfg. Co., Framington, Mass., has been elected president of the Boston Control of the Controllers Institute of America.

At the annual meeting of the Springfield (Mass.) Control of the organization, Paul A. Wilks, controller of the Strathmore Paper Co., West Springfield, was chosen vice-president, and Joseph A. Chadbourne, vice-president and treasurer of the Old Colony Envelope Co., was reelected secretary-treasurer. Joseph A. McKenny, Jr., comptroller of the American Envelope Co., West Carrollton, Ohio, was renamed secretary of the Institute's Dayton Control.

New secretary of the New York City Control is Stuart W. McLaughlin, assistant controller of the West Virginia Pulp & Paper Co. Nelson T. Hampson, comptroller of the Lowe Paper Co., Ridgefield, N.J., was reelected treasurer.

Homer L. Dillard, controller of the Champion Paper & Fibre Co., Hamilton, Ohio, has been named a director of the organization's Cincinnati Control. J. Victor Jaeger, secretary and general auditor of the Brooks-Scanlon Company, Inc., was similarly honored by the members of the Twin Cities Control. Robert L. Stormes, assistant controller of the Oswego Falls Corp., Fulton, N.Y., has been renamed a director of the local controllers' group in Syracuse.

The Controllers Institute of America is a national organization with 38 local chapters — called Controls — throughout the country. Founded in 1931, it now has 3,172 individual members.

Trustee Honored

BOULDER JUNCTION, Wis.—At a recent meeting of the Camp Manitowish Committee of the YMCA, Fred C. Boyce was awarded a plaque for meritorious service. Mr. Boyce, who has been a member of the committee for something over 25 years, is a trustee of the American Pulp & Paper Mill Superintendents Ass'n., Inc.

Tree Planting Gaining Momentum

WASHINGTON—Next year more than three trees will be planted in the United States for every man, woman and child in the country. A total of 368,306,000 tree seedlings are to be produced by state forest nurseries, according to a recent survey by the American Forest Products Industries, Inc., Washington, D. C. This more than doubles last year's 156,976,551.

This seedling production will be increased substantialy by federal and private industry nurseries over the United States, pushing the total to approximately 400 million. While the major job of reforestation is done by nature herself, these seedlings will help to replant areas denuded by improper cutting and forest fires. This record in tree planting is matched only by the volume of new wood now growing on American forest lands, the survey noted.

Total growth now exceeds 13 1/3 billion cubic feet of wood every year, the greatest volume ever recorded in surveys made by the federal government. While this volume virtually equals all the wood taken from our forests every year by man and by natural causes, there is still a deficit in timber large enough for lumber. In this classification, "drain" is reported as 1.53 times growth, but 30 years ago, sawtimber drain was reported as 5.8 times growth.

While many states today have sound forest fire protection systems and are cutting their forest fires, there is still a job for citizens to do in all areas.

Though state forest nurseries will produce the bulk of our seedlings, assistance will be given in six states by federal and private nurseries, as indicated in the accompanying tabulation of figures for each of the 48 states.

State Nursery Seedling Production

State	*1947-1948*	*1948-1949*
Ala.	5,977,000	19,199,000
Ariz.	none	none
Ark.	4,228,000	10,150,000
Calif.	53,000	75,000
Colo.*	177,696*	256,000*
Conn.	390,000	300,000
Del.	170,000	190,000
Fla.	10,750,000	25,000,000
Ga.	17,715,000	48,500,000
Idaho*	300,000*	400,000*
Ill.	3,800,475	6,870,000
Ind.	5,500,000	7,000,000
Iowa	500,000	800,000
Kan.*	900,000*	1,000,000*
Ky.	812,510	1,440,000
La.	9,500,000	25,000,000
Me.	40,000	100,000
Md.	850,000	1,200,000
Mass.	600,000	700,000
Mich.	4,600,000	13,500,000
Minn.	2,500,000	3,500,000
Miss.	14,415,000	19,500,000
Mo.	2,000,000	2,255,000
Mont.	381,300	998,000
Nebr.*	1,500,00*	1,300,000
Nev.	none	3,000
N. Hamp.	365,345	500,000
N. J.	1,095,000	1,000,000
N. M.	none	none
N. Y.	6,770,000	30,000,000
N. Car.	6,000,000	9,160,000
N. Dak.	550,000	750,000
Ohio	2,100,000	3,700,000
Okla.	1,200,000	1,500,000
Ore.	1,500,000	1,750,000
Penna.	7,000,000	60,000,000
R. I.	none	none
S. Car.	11,000,000	25,000,000
S. Dak.*	700,000*	700,000*
Tenn.	200,000	4,000,000
Texas	15,839,000	19,500,000
Utah	131,225	135,000
Vt.	500,000	500,000
Va.	1,600,000	3,000,000
Wash.	150,000	175,000
W. Va.	1,500,000	2,250,000
Wisc.	11,000,000	15,000,000
Wyo.*	116,000*	150,000*
Total	156,976,551	368,306,000

* These states do not have state nurseries. Stock purchased from federal and private nurseries and distributed by State at cost.

Hawkins Retires; Johnson, Successor

TACOMA, Wash. — Edwin E. Hawkins has retired from Blake, Moffitt & Towne after 53 years in the paper business. His paper career began in Minneapolis in 1895. He moved to Oregon in 1916 and associated himself with Blake, Moffitt & Towne's Portland division as a salesman covering Eastern Oregon and Southern Idaho. He transferred to the company's Tacoma office in 1922 as a salesman and later was placed in charge of the city desk and made buyer of wrapping, printing, sanitary and resale items.

Robert Johnson, who has been with the company for the past three years, succeeds to Mr. Hawkins' former post.

Wearne Buys Crehore Mill

NEWTON LOWER FALLS, Mass.—The C. F. Crehore & Son mill has been purchased by the Wearne Paper Corp. The new company is making extensive repairs and the machine is now being operated as a conventional paper machine instead of the former wet machine. Additions and alterations now underway are expected to double capacity. There are three beaters and one 40-inch cylinder making chip sheathing, lining, saturating, 10,000 pounds in 24 hours. President of the company is Charles T. Conrad, and Charles W. Conrad is treasurer. Main office is at 2280 Washington street.

Two views of the same tube ends in high pressure, 3/4" make-up boiler . . . right, just before Nalco treatment; at left, after, new mouth with Nalco — no washing or mechanical cleaning.

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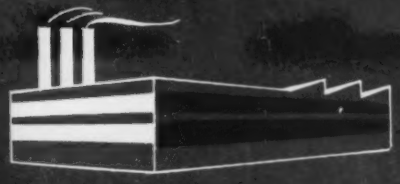

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INDUSTRIAL PRODUCTION, BY INDUSTRIES
(Without Seasonal Adjustment)

[Index numbers of the Board of Governors. 1935-39 average = 100]

Source: Federal Reserve Bulletin, August 1948

Industry	1947 June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1948 Jan.	Feb.	Mar.	Apr.	May	June
Paper and Paper Products	*160*	*145*	*158*	*159*	*163*	*165*	*157*	*163*	*165*	*167*	*169*	*170*	*165*
Paper and pulp	155	140	152	153	157	160	152	157	159	160	163	164	160
Pulp	178	159	176	170	177	182	168	174	178	179	182	188	182
Groundwood pulp	106	96	100	98	97	103	97	91	98	96	107	r112	107
Soda pulp	116	98	105	104	107	112	107	109	110	103	108	112	111
Sulphate pulp	277	253	278	259	275	281	255	276	269	285	293	309	301
Sulphite pulp	151	131	151	149	154	159	148	151	161	153	151	151	146
Paper	152	137	149	150	154	156	150	155	156	157	160	160	156
Paper board	179	166	178	182	184	186	177	187	179	192	192	191	187
Fine paper	88	75	86	87	89	89	86	86	88	85	87	r86	85
Printing paper	162	147	157	157	167	168	162	162	170	161	166	169	168
Tissue and absorbent paper	150	131	148	151	154	158	153	161	167	161	173	r169	160
Wrapping paper	144	124	138	135	141	146	139	145	150	148	151	150	145
Newsprint	92	89	93	97	91	91	87	82	83	82	91	95	95
Paperboard containers (same as Paperboard)	...	...	...	...	...	...	...	...	...	...	...	...	...

r Revised.

HOURS AND EARNINGS OF PRODUCTION WORKERS IN MANUFACTURING INDUSTRIES

[Compiled by the Bureau of Labor Statistics]

Industry group	Average hours worked per week: 1947 Apr.	May	1948 Jan.	Feb.	Mar.	Apr.	May	Average hourly earnings (cents per hour): 1947 Apr.	May	1948 Jan.	Feb.	Mar.	Apr.	May
All manufacturing	*40.1*	*40.1*	*40.5*	*40.2*	*40.4*	*40.0*	*39.8*	*118.6*	*120.7*	*128.5*	*128.7*	*128.9*	*129.2*	*130.1*
Durable goods	*40.5*	*40.5*	*40.9*	*40.5*	*40.9*	*40.5*	*40.1*	*124.3*	*127.8*	*135.5*	*135.2*	*135.2*	*135.7*	*136.5*
Nondurable goods	*39.6*	*39.7*	*40.0*	*39.9*	*39.9*	*39.6*	*39.5*	*112.2*	*113.0*	*121.0*	*121.7*	*122.0*	*121.9*	*123.1*
Paper and allied products	43.0	43.1	43.1	43.1	43.1	42.7	42.8	112.1	113.3	123.5	124.5	124.9	125.0	127.3

NOTE.—Preliminary June 1948 figures for average weekly hours and hourly earnings are: All manufacturing, 40.0 and 131.9; Durable 40.4 and 139.0; Nondurable 39.7 and 124.2, respectively. Back figures are available from the Bureau of Labor Statistics.

FACTORY EMPLOYMENT AND PAY ROLLS, BY INDUSTRIES
(Without Seasonal Adjustment)

[Index numbers of the Bureau of Labor Statistics, 1939 = 100]

Industry group or industry	Factory employment: 1947 May	June	1948 Feb.	Mar.	Apr.	May	June	Factory pay rolls: 1947 Apr.	May	June	1948 Feb.	Mar.	Apr.	May
Paper and Allied Products	*146.1*	*146.1*	*147.8*	*148.0*	*146.8*	*146.4*	*146.6*	*296.0*	*296.3*	*303.4*	*328.9*	*330.8*	*325.7*	*331.9*
Paper and pulp	140	141	145	146	145	146	....	284	289	302	328	330	328	339
Paper goods, n.e.c.	153	154	152	152	150	151	....	302	307	302	327	328	324	328
Paper boxes	142	140	139	137	134	132	....	290	283	284	307	305	293	290

St. Regis Supply-Demand

WATERTOWN, N. Y.—Roy K. Ferguson, president of the St. Regis Paper Co., stated here on August 24 that there is a balance between demand and production for all grades of paper manufactured by the company under its new production program resulting from plant expansion in 1947-48.

Mr. Ferguson, in company with five other St. Regis officials, made an inspection tour by automobile of all his firm's plants in northern New York. With him were E. R. Gay and Lyman A. Beeman, vice-presidents; Horace R. Lamb, general counsel; W. H. Versfelt, vice-president and treasurer, all of New York City, and William R. Adams, head of the crafts department.

"The new production which has come in late 1947 and 1948 is serving to bring the demand for all grades of paper into balance with production," said Mr. Ferguson. "However, certain craft grades of paper and production are still in short supply as in newsprint."

Mr. Ferguson said that the extensive St. Regis improvement program will be completed late this year or in early 1949. "Over the past ten years," he said, "St. Regis has expended $60,000,000 in improvements and acquisitions of property and timber lands."

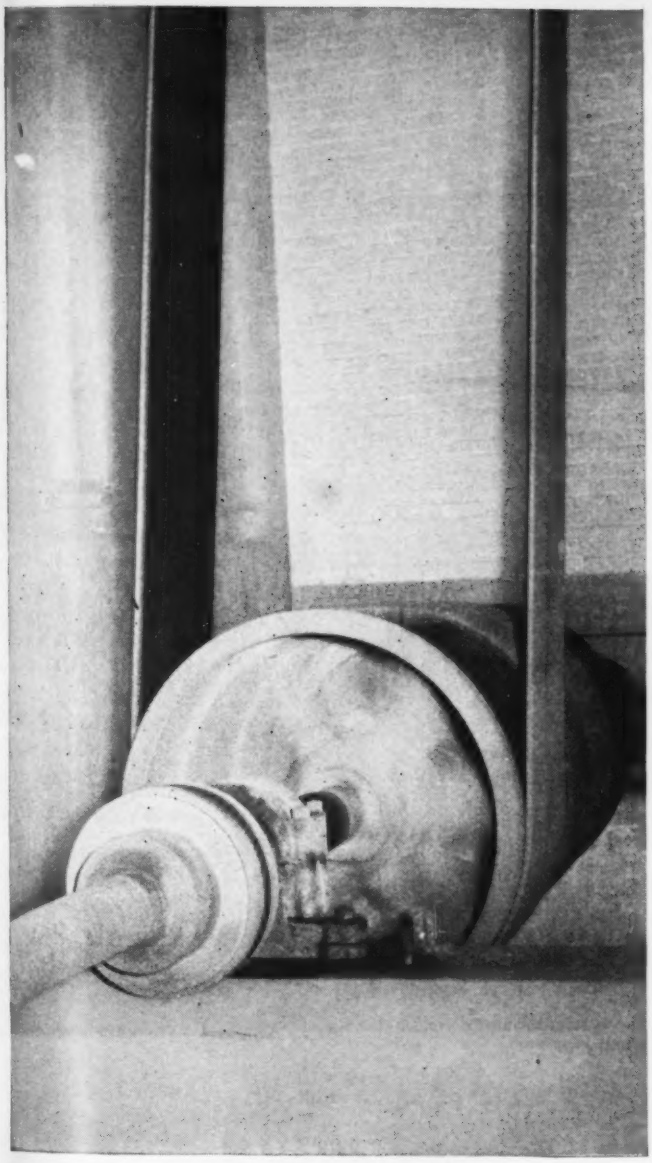
Glover Returns to Old Firm

BOSTON—John G. Glover, for the last two years representative of Lewis-Brownville Sales, Inc., here, and previously for ten years with Tileston & Hollingsworth, returned to the latter firm on September 1 to handle merchant sales. As previously reported in these columns, Douglas B. Cowie is now in charge of New England sales of Lewis-Brownville Sales, Inc., succeeding Mr. Glover.

Bosch to Latin Americas

NEW YORK — Juan P. Bosch of the Bulkley, Dunton Paper Co., S.A., the paper exporting unit of the organization, left on August 20 for a visit to the Latin American countries in Central and Northern South America and the West Indies. The journey will be entirely by air and will take about 90 days. On his trip Mr. Bosch will visit the company's branch offices and sales representatives. He will also supervise reorganization of some of the offices in that territory to meet increased business volume.

RHOADS *Tannate* LEATHER BELTS



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Import Duty Classifications

NEW YORK — Charcoal drawing paper, all sulphite in content, has been classified for duty as drawing paper, not at the lower rate for printing paper as claimed by the importer, who tried in vain to secure the support of the Import Committee of the American Paper Industry for his contention, Warren B. Bullock, manager of the Committee, reports.

New cases before Customs officials, listed by Mr. Bullock, include the following:

Bible paper weighing between 10 and 20½ pounds per ream, imported at San Francisco, claimed to be dutiable at the lower rate for printing paper and not as Bible paper because it is produced from woodpulp and not rag stock; a southern importer is endeavoring to secure duty-free classification for nine-inch rolls of newsprint imported before Congress passed an emergency law making such paper duty-free for a limited period. Kraft screening paper for interleaving sheet steel, believed by Import Committee to be dutiable as wrapping paper at 25 percent, and not as kraft wrapping at 20 percent.

Richey's September Itinerary

CINCINNATI—John L. Richey, executive secretary and counsel of the Paper & Twine Ass'n., plans to attend the following meetings in September:

(8th) Louisville Paper Merchants, Brown Hotel, Louisville; (9th) Indianapolis Paper Merchants, Hotel Severin, Indianapolis; (14th) Illinois State Paper Merchants Ass'n., Hotel Blackstone, Chicago. On same date in the evening, Chicago Paper Ass'n., Hotel Bismarck, Chicago; (15th) Wisconsin Paper Merchants, Hotel Schroeder, Milwaukee; (16th) Michigan Paper Merchants, Hotel Rowe, Grand Rapids; (21st) Columbus Paper Merchants, Columbus Athletic Club, Columbus, Ohio; (22nd) Cleveland Paper Merchants, Hotel Cleveland, Cleveland; (23rd) Toledo Paper Merchants, Hotel Commodore Perry, Toledo, Ohio.

Young Interim Chairman

VANCOUVER, B. C.—J. A. Young, vice-president of Pacific Mills, Ltd., will take over the chairmanship of the Western Branch, Canadian Pulp & Paper Ass'n., for the remainder of the 1948 period, following the resignation of Benton R. Cancell, who is leaving British Columbia for the Eastern United States to take over an executive position with the St. Regis Paper Co.

Pulpwood Rate Hike Delayed

RALEIGH, N. C.—The North Carolina Public Utilities Commission has ordered all railroads operating in the State to comply with new pulpwood rates by September 10.

The commission on August 20, rejected a petition by railroads asking that the new rates not be made effective pending outcome of court protests filed by the Seaboard Air Line Railway and the Atlantic Coast Line.

Commission attaches said the rates were ordered originally on June 8, to be effective August 23. "The postponement until September 10 was in response to a hearing held August 16," it was explained.

Australia-Sweden Pact

Australia has concluded a new trade agreement with Sweden which provides that Sweden will grant licenses until April 30, 1949, and will export soft wood, coke, cardboard, cartons, paper and timber. In return Australia will facilitate export of wool, fresh apples and pears, eucalyptus oil, lanolin, wool grease, canning extract and various metals and acids.

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Technical Writers

Paper Trade Journal in the Industrial Development Section, makes space available for discussion of administrative and operating problems. Space is also available for presentation of independent studies and research on technical and engineering subjects. Feature stories of paper mills, converting plants and interrelated industries will also be included.

An invitation is cordially extended to all who are qualified to discuss these subjects.

Original manuscripts submitted exclusively to Paper Trade Journal and found suitable for use in this section will be paid for immediately upon acceptance. Submit manuscripts to E. P. McGinn, Industrial Editor.

Gumbin Will Codicil

CHICAGO—A petition filed with the will of the late Nathan Gumbin, president of the General Fibre Co., revealed an estate valued at $10,000. This does not include $270,000 in business and personal insurance which he was reported to have carried.

Attorney Harry Okin, who filed the will, said the General Fibre Co., of which Gumbin was a part owner, was heavily encumbered.

One-third of the estate was left to his widow and two-thirds to his two sons.

Paperweight Calculator Revised

NEW YORK—The Baldwin Paper Co., Inc., has revised and reprinted its "Executive" Paperweight Calculator, a handy pocket-size book that shows "at-a-glance" the basis weight of any size book paper from 30-lb. to 130-lb., inclusive. The Calculator also shows how to quickly find the basis weight of different sizes of bonds, mimeos, writings, ledgers, index, bristols, covers and tags.

St. Regis Ad Portfolio

NEW YORK — In the May issues of *Time, Newsweek, Fortune* and other magazines, the St. Regis Paper Co. launched a new series of institutional advertisements. These advertisements have been reproduced in a large portfolio, in full size and full color.

Each advertisement shows a background of trees, the basic raw material for all St. Regis products and carries a message from R. K. Ferguson, St. Regis president, stating and re-stating the fundamental of good forest management . . . that "a crop is grown, a crop is taken, but the wealth of the woods remains."

"Having established our policy of conservation in management of the 1,800,000 acres of timberland which we own or operate, we carry subsequent advertisements through the cycles of our major manufacturing divisions, (1) printing, publication and converting papers, (2) St. Regis packaging systems, comprising multi-wall bags and bag filling machines, and (3) Panelyte, the St. Regis plastic," Mr. Ferguson points out. "Trees continue to be the background of each advertisement, and subsequent pages will follow the same cycle."

"To date this new series has brought forth an interesting number of unsolicited letters," he adds.

Forsythe Technical Super

NIAGARA FALLS, N. Y. — James J. Forsythe has been named technical superintendent of the International Paper Co. plant, H. B. Bailey, manager, reports. Mr. Forsythe has been with the plant for two years. His record includes work in the Hawthorne Paper Co.'s plant, followed by ten years with the Fraser Paper Co. and two with the Waxide Paper Co.

Youngstown Firm Grows

YOUNGSTOWN, Ohio — The Paper Corp. of Youngstown, new paper distribution firm recently moved into a warehouse in Hubbard, but has offices in the Scheen-Wagner building, here. The firm was organized last May 1 by William G. Goodridge of Canfield, Richard J. Good of Bedford, and Roy Meyer of New York.

Cross Corp. In New Home

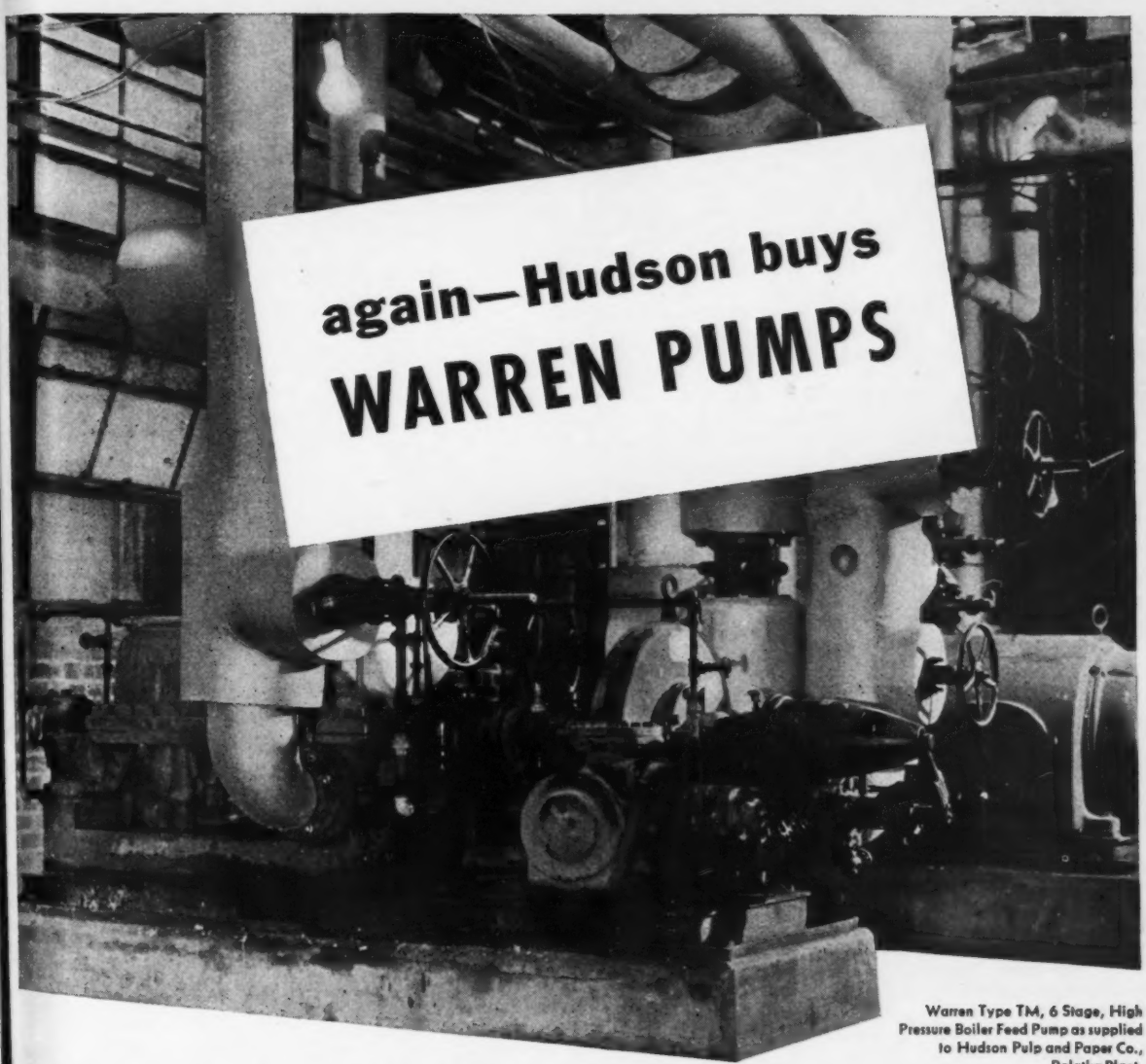
NEW YORK—Cross Paper Products Corp., which recently moved to 437 Bronx boulevard, has named Robert L. Hoffmann, president; Michael A. D'Andrea, vice-president; Joseph A. Sammarco, secretary and Joseph C. Hoffman, treasurer.

Thomas Evans Elected

FORT WAYNE, Ind.—Thomas Evans has been elected vice-president in charge of sale of the Fort Wayne Corrugated Paper Co.

Sickles Joins Crown-Mark

NEW YORK—C. E. Sickles has been appointed to the sales staff of the Crown-Mark Paper Corp.



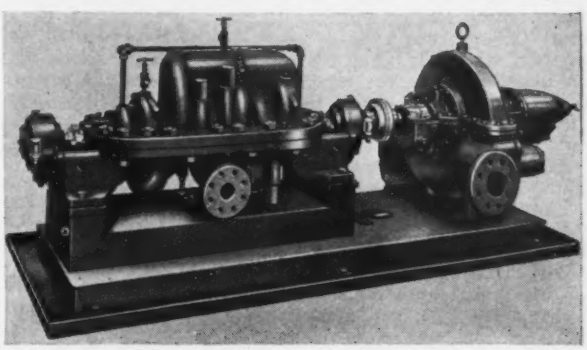
Warren Type TM, 6 Stage, High Pressure Boiler Feed Pump as supplied to Hudson Pulp and Paper Co., Palatka Plant.

For the power plant in their new Palatka, Florida, mill, Hudson Pulp and Paper Company chose Warren Six Stage, High Pressure Boiler Feed Pumps; also Warren Condensate Pumps. Furthermore, Warren Pumps are performing important services in several other Hudson plants.

Warren Pumps are their own best salesmen. They bring repeat business by dependable, low-cost, on-the-job performance.

Warren makes a superior pump for *all* power and various process services. There is a Warren Representative near you. Let us send him to discuss your next pumping problem.

P-16



WARREN STEAM PUMP COMPANY, INC. SERVICE EVERYWHERE **WARREN, MASS.**

WARREN PUMPS

CENTRIFUGAL AND RECIPROCATING

For: Power Plants — Chemical Plants — Paper Mills — Food Industries — Metal Working — Oil and Mining Services

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, September 8, 1948.

Today—post Labor Day—is the tomorrow so hopefully awaited throughout the summer's dragging demand. Call it a seasonal lull, a period of inventory adjustment, or mill repairs and vacations, doldrums, or what you did, its impact registered on pulp producers and distributors, wastepaper and rags, alkalis and other heavy chemicals, starches, casein and naval stores, as well as on the paper and paperboard industry itself. Consequent shifts from postwar inventories are described by at least one trade paper as "pre-depression," a return to normal conditions. Mill inventories of finished goods are reported at healthy lows, distributors' stocks sufficient-to-ample for a buyers' market. Promotional campaigns to stimulate rag-content already have appeared in a smart broadside "Rag Papers Are Better."

National Summary of Business Conditions

From reports of the Board of Governors of the Federal Reserve System, it seems that pulp and paper reflected national conditions during July and August. The National Summary of Business Conditions released on August 28 states that "industrial output declined somewhat in July and regained part of the loss in August. Unusually favorable weather in July resulted in a further marked gain in corn prospects. Prices of basic commodities generally decreased somewhat further from mid-July to the latter part of August, reaching the lowest levels since the end of August 1947. The general wholesale price level showed little change and was 10 percent higher than a year ago. The Board's seasonally adjusted index of industrial production declined five points in July to a level of 187 percent of the 1935-39 average. This decline reflected in large part the effects of employee vacations especially in nondurable industries. Preliminary information for the first part of August indicates a somewhat higher rate of total production than in July. Output of durables showed a slight decrease in July. Production of iron and steel declined 3 percent but recovered during August to about June rate. Activity in the automobile industry showed a substantial further gain in July as assembly of passenger cars and trucks reached a new postwar peak rate. Lumber production increased more than seasonally in July. Output of most other durable goods declined somewhat. Production of nondurables declined about 4 percent in July, mainly because of reduced activity in the textile and paper industries. Cotton consumption declined 18 percent from June to July as compared with a decrease of 11 percent during the same period last year. Activity in most other nondurable goods industries showed little change.

Prices

As the new season starts, the question of prices is getting first consideration. In view of the slowed demand, studying prices of pulp, cottons, waste paper, et cetera, has become as much a fixation as watching the corn, cotton, potato and meat markets.

First big news to break is early announcement of fourth quarter market pulp prices. Indications are that Swedish prices will take a general drop of $20 per ton on contract prices. Two mills have announced the following prices on dock Atlantic ports, per short air-dry ton: bleached sulphate $165, bleached sulphite $165, unbleached kraft $127.50.

Several of the leading manufacturers of bleached sulphite pulp in Norway are now quoting $165 per short ton, on dock Atlantic ports. New price is effective immediately.

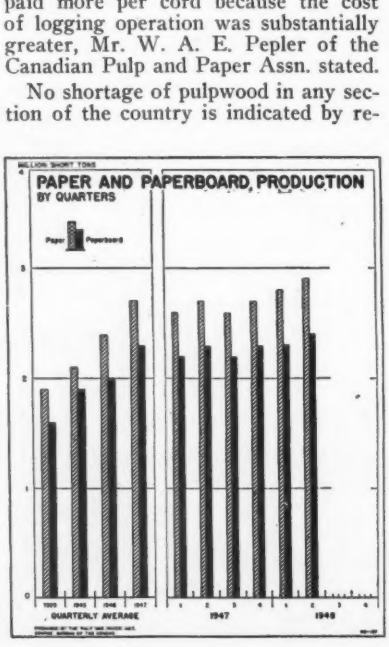
Prices on U.S. and Canadian pulp also have commenced to come in with early notices that third quarter levels will be maintained as a whole, the exception being a downward bend on Canadian unbleached kraft prices.

Generally, leading economists see the nation's economy settling down to a steadier pace regardless of administration, with the effects of the settling process being felt by the fringes of the boom only.

Pulpwood

Total wood harvest during the past season by Canadian mills is reported at 8,500,000 cords, an increase of more than 10 percent over 1947 and 15 percent over 1945-46. Pulp and paper mills paid more per cord because the cost of logging operation was substantially greater, Mr. W. A. E. Pepler of the Canadian Pulp and Paper Assn. stated.

No shortage of pulpwood in any section of the country is indicated by reports from field offices of the U. S. Dept. of Commerce. Supplies in "the Lake States area are reported as generally plentiful with prices sufficiently attractive to encourage increased cutting by farmers in all but the northern part where deliveries are extremely limited. Receipts of wood are enabling most mills in that region to build up inventories, with the result that pulpwood stocks are reported as invariably good. In the southern region, it is indicated that inventories had increased steadily since April and that a prolongation of favorable weather would permit further satisfactory accumulation. Pulpwood supplies in Canada, which accounted for nearly 10 percent of our total mills receipts during the first half of 1948 are reportedly well in excess of current Canadian pulp and paper mill requirements as a result of last season's record cut. This surplus, particularly in eastern Canada, has manifested itself in an increase of approximately 175,000 cords or 21 percent of U.S. imports of Canadian pulpwood during the first half of 1948, compared with the same period of 1947. Despite trade reports of gradual reductions in the exports of Ontario pulpwood to the U. S. in accordance with the progressive embargo of that Province, receipts of imported wood in the Lake States region reveal a moderate gain between the two half-yearly periods compared. A note of optimism is reflected in the expectation that plentiful and cheaper pulpwood may be available in Canada for an indefinite period.



Indexes

Index of general business activity for the week ended Aug. 28 dropped to 149.3 from 150.3 in the preceding week, compared with 143.2 for the corresponding week of 1947.

Index of paperboard production dipped to 175.0 from 180.1 in the preceding week, compared with 168.1 for the corresponding week of 1947.

Comparative ratios of U. S. paper and paperboard production to mill capacity as reported by AP&PA are shown below:

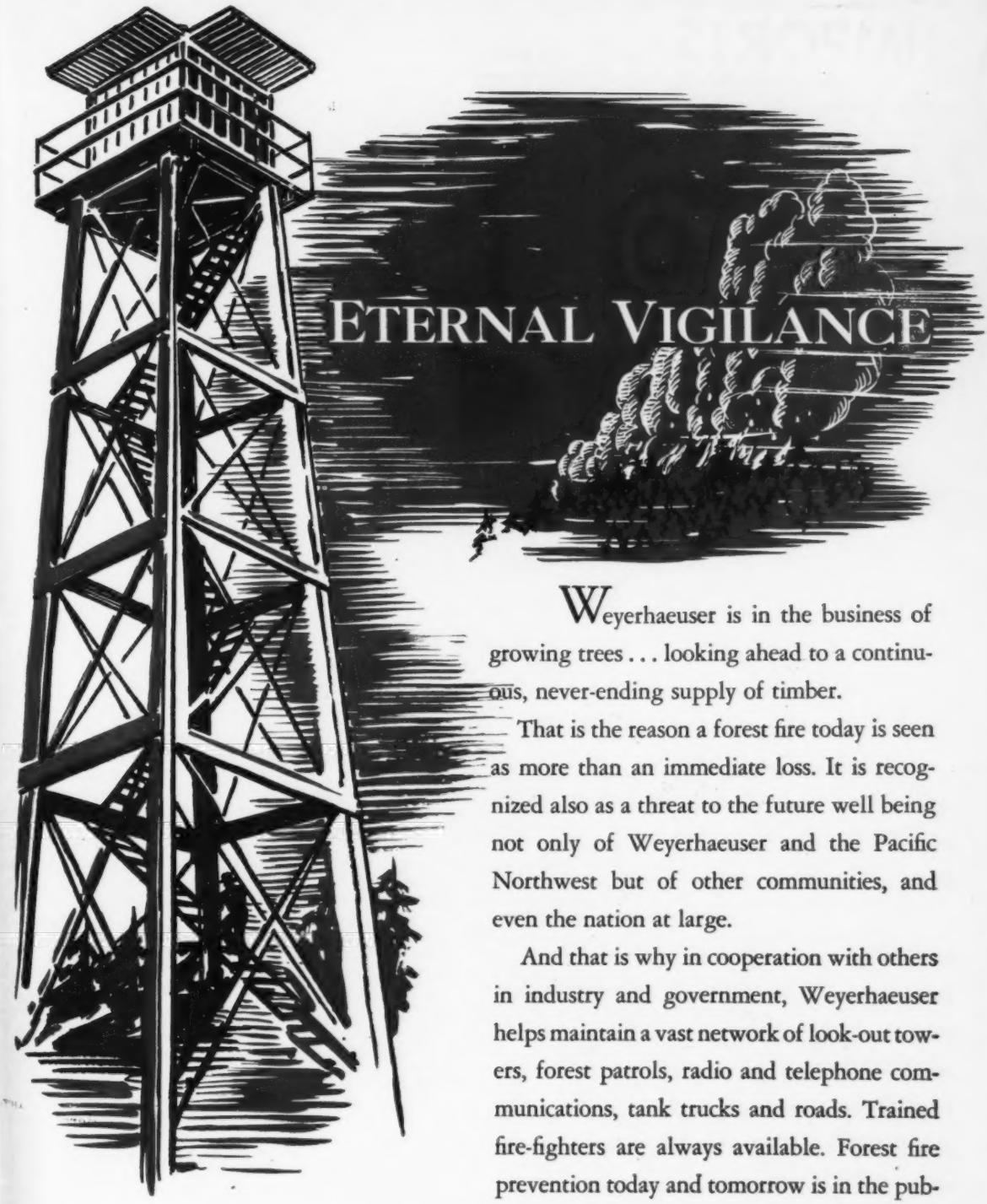
	Aug. 28 1948	Aug. 21 1948	Aug. 30 1947	Aug. 31 1946	Sept. 1 1945
Paper* ...	96.5**	97.7†	104.1	105.6	95.2
Paperboard	93.0	93.0	99.0	100.0	97.0

* Because of increases in 1948 capacity, tonnage production was greater than last year's, although this year's production ratio is lower.
** Indicates 1948 volume of 172,533 tons. Comparable week 1947, 165,106 tons.
† Revised figure.

Paperboard Production (Tons)

	Aug. 28 1948	Aug. 21 1948	Aug. 30 1947	Month of Aug.
Production .	183,835	185,537	176,588	732,040
New Orders.	166,039	175,762	167,268	729,029
Unfilled Orders ..	344,469	362,761	425,412	344,469

Percent of Activity, Current	93%
Percent of Activity, Year to Date	97%
Percent of Activity, Average	92%



Weyerhaeuser is in the business of growing trees . . . looking ahead to a continuous, never-ending supply of timber.

That is the reason a forest fire today is seen as more than an immediate loss. It is recognized also as a threat to the future well being not only of Weyerhaeuser and the Pacific Northwest but of other communities, and even the nation at large.

And that is why in cooperation with others in industry and government, Weyerhaeuser helps maintain a vast network of look-out towers, forest patrols, radio and telephone communications, tank trucks and roads. Trained fire-fighters are always available. Forest fire prevention today and tomorrow is in the public interest for the present and the future.

PULP DIVISION

WEYERHAEUSER

IMPORTS

Week Ended September 4

NEW YORK

Newsprint

R. A. Olsen, Inc., G. T. D., Donnacona, 451 rolls.
Pagel Horton & Co., Inc., Stavangerfjord, Oslo, 260 rolls.
R. A. Olsen Inc., G. D. D., Donnacona, 475 rolls.
H. G. Craig Co., A. C. D., Donnacona, 341 rolls.
Madden Reeve Angel & Co., Inc., Mormacpine, Kotka, 153 rolls.
R. A. Olsen Inc., Donpaco, Donnacona, 422 rolls.
Montmorency Paper Co., Storfjelld, Botwood, N. F., 4187 rolls.
H. G. Craig Co., Newscarrier, Donnacona, 374 rolls.

Filter Paper

Rohner Gehrig Co., St. Malo, Bordeaux, 33 cs.

Spongy Paper

Rohner Gehrig Co., St. Malo, Bordeaux, 38 bls.

Printing Paper

News Syndicate Co., American Merchant, Havre, 143 rolls.
Winsor Newton Inc., American Leader, London, 1 cs.

Wallpaper

Intra-Mar Shipping Co., American Merchant, Havre, 1 cs.

Tissue Paper

B. F. Drakenfeld & Co., Media, Liverpool, 1 cs. (skin transfer).

Gummed Paper

B. F. Drakenfeld & Co., Media, Liverpool, 34 cs., 2 drums.

Photo Paper

(———), American Leader, London, 5 cs.

Serviettes

H. W. Robinson Co., American Leader, London, 12 cs. (& table mats).
(———), Media, Liverpool, 13 cs. (crepe paper).

Cardboard

M. Zanadu Manufacturing Corp., St. Malo, Havre, 5 cs.

Packing Paper

J. P. Heffernan Paper Co., Mt. Davis, Genoa, 50 bls.

Miscellaneous Paper

Heidl's Inc., Aardyk, Rotterdam, 1 cs.

Rags, Baggings, Etc.

National City Bank, City of Calcutta, Calcutta, 15 bls. jute twine rag cuttings.
Atlas Waste Manufacturing Co., Agwiking, Havana, 22 bls. cotton waste.
E. J. Keller Co., Inc., St. Malo, Havre, 39 bls. old cotton rags.
(———), St. Malo, Bordeaux, 65 bls. old cotton rags.
Chase National Bank, St. Malo, Bordeaux, 64 bls. old cotton rags.
E. J. Keller Co., Inc., St. Malo, Bordeaux, 26 bls. rags.
(———), Mohamed el Kebir, Alexandria, 82 bls. old white cotton rags, 49 bls. burlap bagging, 39 bls. hessian bagging.
Bank of New York, Mohamed el Kebir, Alexandria, 82 bls. old cotton rags.
National City Bank, Mohamed el Kebir, Alexandria, 49 bls. heavy bagging, 58 bls. scrap bagging, 140 bls. old cotton rags.
E. J. Keller Co., Inc., Mohamed el Kebir, Alexandria, 71 bls. old cotton rags.
Royal Manufacturing Co., Raphael Semmes, Antwerp, 50 bls. cotton waste.
E. J. Keller Co., Inc., Maine, Copenhagen, 245 bls. old bagging.
Williamson Northrup, Mormacmoon, Santos, 50 bls. cotton waste.
A. de Vries Trading Corp., Ames Victory, Antwerp, 109 bls. old bagging.
New England Waste Co., Mt. Davis, Bombay, 1150 bls. cotton waste.
New England Waste Co., Mt. Davis, Genoa, 122 bls. cotton waste.
Cowa & Co., S. I. Brodin, Rio de Janeiro, 90 bls. cotton picker waste.
National City Bank, Clan Angus, Port Said, 63 bls. old heavy scrap burlap bagging.
Castle & Overton, Inc., Exchequer, Genoa, 50 bls. jute rags.

Old Rope

E. J. Keller Co., Inc., Mohamed el Kebir, Alexandria, 59 bls. old rope.
National City Bank, City of Calcutta, Calcutta, 65 bls. old hemp rope cuttings.
(———), City of Calcutta, Calcutta, 95 bls. old hemp rope cuttings.

China Clay

Proctor & Schwartz, Gloucester City, Avonmouth, 5 bags.

Casein

National City Bank, Mormacmoon, Buenos Aires, 650 bags (unground lactic).

BOSTON

E. Butterworth & Co., Inc., Ames Victory, Antwerp, 256 bls. picker waste.

PHILADELPHIA

Madden Reeve Angel & Co., Inc., Mormacpine, Kotka, 769 rolls newsprint.
Darmstadt Scott & Courtney, Ames Victory, Antwerp, 126 bls. jute waste.

LOS ANGELES

Castle & Overton, Inc., Mt. Davis, Bombay, 100 bls. old jute rags.
Bank of New York, Mt. Davis, Bombay, 100 bls. old jute rags.

Bizonal Area, Germany

Production of sulfite pulp in the Bizonal Area of Germany totaled 111,000 metric tons in 1947, compared with 86,900 tons in 1946, and 550,800 tons in 1936.

Paper and paperboard production amounted to 330,700 tons in 1947, compared with 311,500 tons in 1946, and 1,272,000 tons in 1936. Of the total output in 1947, newsprint represented 49,200 tons.

The production index of pulp and paper was 37 in February 1948 (1936=100), compared with 33 in December 1947, and 18 in February 1947. (These indexes were not adjusted for seasonal variation.)

Tunisian Imports

Imports of paper and paperboard into Tunisia from the United States in 1947 totaled 845,123 kilograms (1 kilogram=2.204 pounds) valued at 35,117,417 francs (about $295,000).

Italy's Paper Trade

Imports of paper and paper products into Italy totaled 201,627 metric tons and were valued at about $41,000 during 1947. Exports of such products amounted to 11,977 tons and were valued at nearly $6,500.

Philippine Paper Trade

The principal imports of paper into the Philippines during 1947, with imports from the United States in parentheses, given in thousands of kilograms (1 kilogram = 2.2046 pounds) were as follows: Newsprint, 17,526 (12,072); other printing paper, 1,330 (1,298); cigarette paper, 314 (172); crepe and tissue, 285 (all); toilet paper, 386 (378); paper towels and napkins, 346 (345); kraft wrapping, 1,345 (653); old newspapers for wrapping and packing, 8,934 (8,930); other wrapping, 2,060 (1,846); and paper bags, 3,310 (3,296).

Wallboard imports totaled 14,443,000 kilograms, of which 8,168,000 kilograms came from the United States. Imports of paperboard in sheets amounted to 2,437,000 kilograms, of which 1,880,000 kilograms came from the United States.

Mexican Alkalis

Production of soda ash and caustic soda at the new plant of Sosa-Texcoco, S. A., Mexico, is scheduled to reach 30,000 and 12,000 metric tons respectively in 1948. Increased output of soda ash may be achieved, but it is doubted that production of caustic soda will exceed 10,000 tons. The plant started to produce soda ash and sodium bicarbonate in July 1947 and caustic soda in Dec. 1947.

New Titanium Source

MONTREAL—Construction of the new titanium smelter at Sorel, Quebec, by the Kennecott Copper Co. and New Jersey Zinc Co. interests, which will involve an initial capital investment of some $20,000 to $25,000 and which, in its early stages of operation, will be shipping titanium slag to a value of up to $10,000,000 annually to the United States, is expected to start shortly.

Workers Reject Local

PETERSBURG, Va.—In a consent election held September 1, workers at the Virginia Fiber Corp. rejected a proposal to form a local union requested by the United Paper Workers of America (CIO). The election was conducted by the National Labor Relations Board. The company was represented by Benjamin T. Kinsey, Jr., of Petersburg, and the union by Robert W. Turner, of Richmond.

Koffman Firm Incorporates

BOSTON — Koffman Paper Products, Inc., 15 Union street, Lawrence, Mass., has been incorporated to deal in all kinds of papers, wooden ware, plastics, etc., with capital stock of 900 common shares of no par value. Joseph G. Koffman is president; Edith K. Berger, treasurer; J. John Berger, clerk.

St. Joe Acreage Upped

TALLAHASSEE, Fla. — The St. Joe Paper Co. has added an 1,150-acre farm to recent Leon County land purchases which have totaled more than 25,000 acres. The paper concern acquired the farm of State Rep. Payne H. Midyette at an indicated price of $50,000.

Vacations the Hard Way

BOSTON—Leon M. Woodworth, sales manager for the Poinier-Carmer Co., paper board dealer, utilized his vacation to remove from Maywood, N. J., to Needham Heights, Mass.

FINLAND

DELIVERS HER

WOOD PULP

MONTHLY

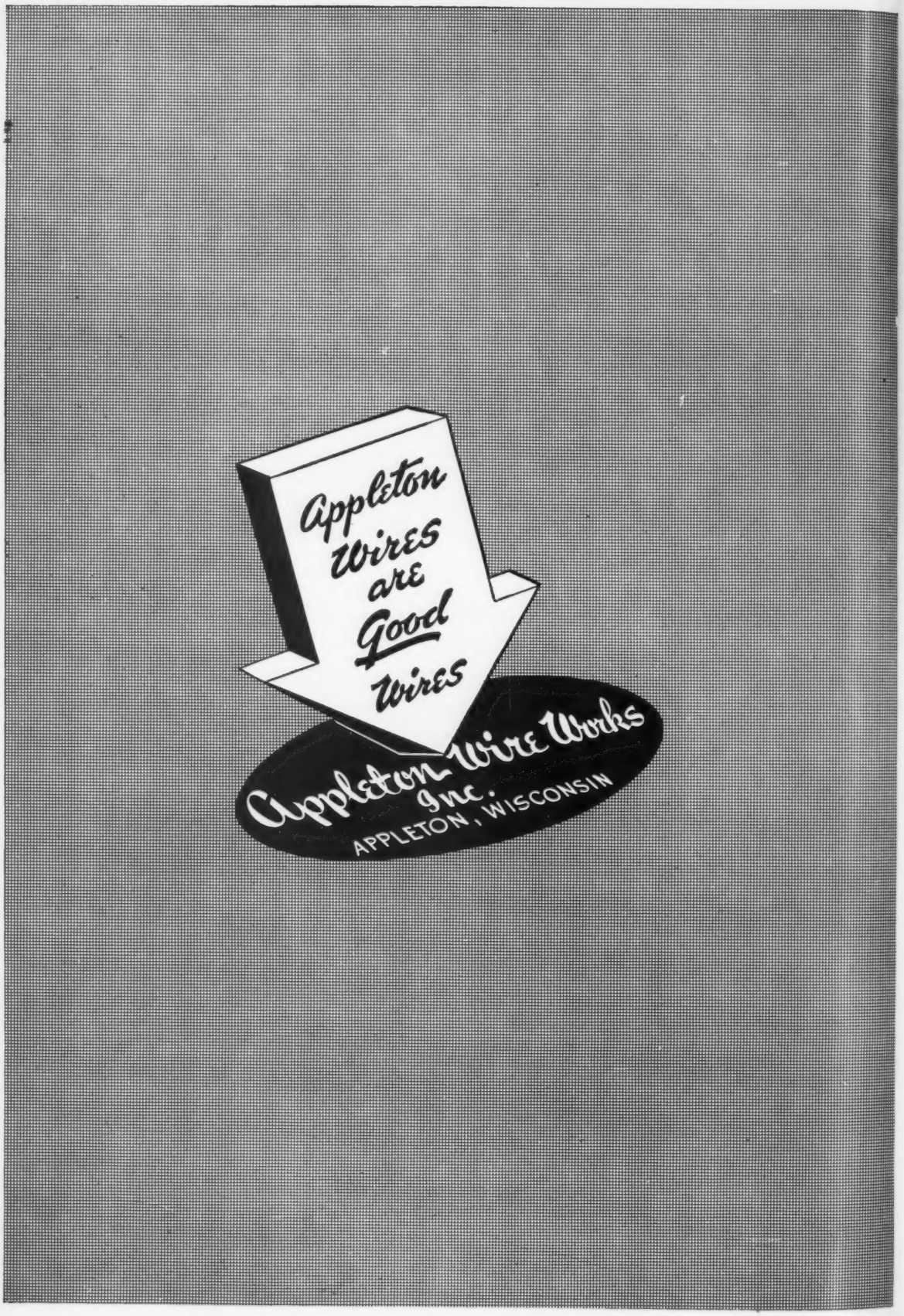
THROUGHOUT THE YEAR

(NO CLOSED NAVIGATION)

PULP SALES CORPORATION

230 Park Ave., New York 17, N. Y.

Telephone: MUrray Hill 5-8764


Appleton
Wires
are
Good
Wires
Appleton Wire Works
Inc.
APPLETON, WISCONSIN

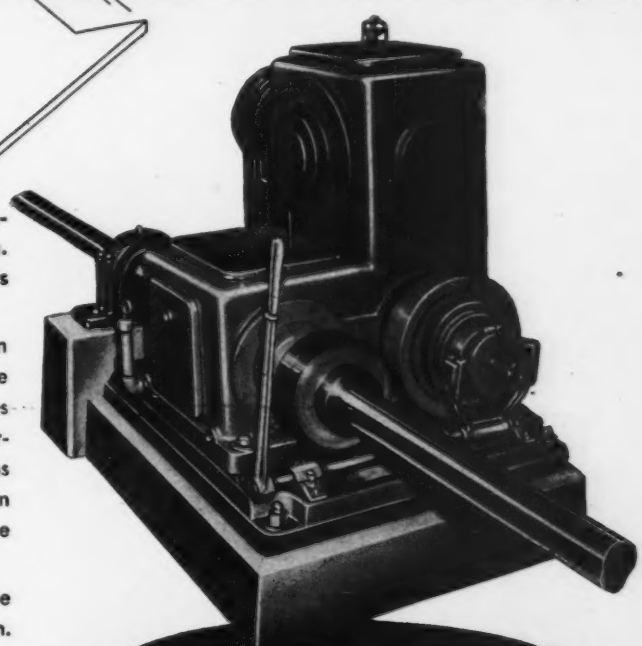
Installation of SYCO Drives has helped to increase paper output on each installation. SYCO contributes to quality control because it is smooth running . . . all the draws stay put.

The precise control mechanism of the modern SYCO Paper Machine Drive facilitates quick, close adjustment of sectional speed . . . then maintains the selected speed without departure. SYCO's interlocking synchronization holds the individual sections in precise speed ratio — preserving uniform tension on the sheet at all times. Breaks are fewer — the machine stays in production with less time out.

SYCO's exact speed control is matched by the ruggedness of its soundly engineered mechanism. SYCO is built for long trouble-free life.

The compact, self-contained modern SYCO drive requires less space, permitting clean, accessible uncluttered space around the machine.

Can the Modern SYCO Paper Machine Drive earn dividends in *your* mill? Write us for full details!



SYCO
MANUFACTURING CORPORATION
Syracuse, N. Y.

PRICES

Quotations indicate trends in an open market. At the moment they can be of little more value. While some volume business still is done under contract at the figures shown, fluctuations are too varied and frequent to permit prices to be interpreted as representing a wholly stabilized market.

NEW YORK

Paper

(Delivered New York)

Standard News, per ton—	
Rolls, contract	$96.00/100.00
Sheets	111.00/ —
Kraft—per cwt.—Carload Quantities Zone A Deld. 40 lb. base wgt.	
Superstandard Wrapping	$9.00/ —
No. 1 Wrapping	7.25/ 8.00
Standard Wrapping	7.00/ —
Standard Bag	6.50/ —
Tissues—Per Ream 24x36 (480) 11 lbs. Zone 1.	
Wh. No. 1 Frd.	$1.84/$2.00
Wh. No. 1 M. G.	1.94/ 2.00
Wh. No. 1½	1.60/ —
Wh. No. 2	1.75/ —
Kraft Anti-Tar	1.65/ —
Kraft Unbl.	1.85/ —
Manila No. 2	1.62/ —
Shred. Wh. No. 1 cwt.	1.10/ 1.50
Toilet—Per Case of 100 rolls—1 M Sheets.	
Unbleached	$8.50/$10.00
Bleached	8.50/ 10.00
Paper Towels—Per Case of 3750—Zone 1.	
Wh. Jr. M'tif'd 9¼x9½	$5.15
Br. Sr. M'tif'd 10x12	3.60
Br. Jr. M'tif'd 9½x9¾	3.10
Br. Jr. Sgl. fold 10x10¾	3.15
Manila—per cwt.—C-1 f.a.	
No. 1 Jute Tag	$14.50/ —
Reg. Jute Manila	13.25/$15.50
No. 1 Manila	9.75/ —
5 lb. Manila	10.75/ 11.25
Boards, per ton—	
Filled News	94.00/ —
Plain Chip	90.00/ —
Bldhd. Mla. L-d. Chip*	105.00/ —
White Pat. coated*	120.00/ —
Kraft Liners 42 lb.	105.00/ —
Kraft Corr. .009	110.00/ —
Binders Boards	126.00/ —

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—
White, 16 lb.
Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$59.00	$54.55	$52.30
100% Rag	52.25	48.30	46.30
75% Rag	40.00	37.05	35.50
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Ledgers, per cwt.

100% Rag Ext. No. 1	$57.00	$52.65	$50.50
100% Rag	50.25	46.40	44.50
75% Rag	40.00	37.05	35.50
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Sulphite Bonds and Ledgers—
White, 16 lbs.
Bonds, per cwt.

No. 1	$21.25	$19.25	$18.50
No. 2	20.25	18.30	17.55
No. 4	19.25	17.55	16.85

Ledgers, per cwt.

No. 1	$21.75	$19.65	$18.85
No. 2	20.75	18.75	18.05
No. 4	20.00	18.10	17.35

Free Sheet Book Papers—
White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated	$20.40	$19.50
No. 2 Glossy Coated	19.15	18.30
No. 3 Glossy Coated	18.40	17.60
No. 1 Antique (Watermarked)	15.90	15.15
No. 2 Offset	15.15	14.60
	to	to
	17.90	17.10
A Grade E. F.	14.90	14.25
A Grade S. & S. C.	15.40	14.65
B Grade E. F.	13.90	13.30
B Grade S. C.	14.40	13.70

Wood Pulp

Domestic mill contract prices delivered with varying freight allowances.

	Per Short ADT
Groundwood	$80.00/$81.00
Unbleached Sulphite	124.00/ —
Bleached Sulphite	125.00/135.00
Bleached Soda	130.00/ —
Bleached Sulphate	175.00/185.00
Unbleached Sulphate Northern	125.00/155.00
Unbleached Sulphate Southern	130.00/145.00

Canadian Quotations

Prices delivered with varying freight allowances unless otherwise specified:

	Per Short ADT
Bleached Sulphate	160.00/185.00
Unbleached Sulphate	125.00/150.00
Unbleached Sulphite	125.00/126.00
Bleached Sulphite	125.00/135.00
Glassine Unbleached Sulphite (no freight allowance)	120.00/ —
Bleached Soda	130.00/ —
Groundwood	80.00/ 85.00
Sideruns Pulping News	80.00/ 90.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations

On dock, Atlantic Ports

Bleached Kraft	185.00/ —
Bleached Sulphite	185.00/ —
Unbleached Sulphite	155.00/157.50
Unbleached Kraft	147.50/ —

Finnish Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite	$187.50/ —
Unbleached Sulphite	155.00/157.00
Unbleached Sulphate	147.50/ —

New Domestic Cotton Cuttings

(F.o.b. Ship. Pt. Plus Dealer's Commission)

White Shirt	$11.00/$11.50
Unbleached Muslin	11.50/ 12.00
Light Silesias	9.00/ 9.25
White Back Blue Overalls	9.00/ 9.50
Blue Overalls	8.00/ 8.25
Fancy Shirt	6.50/ 7.00
Light Percales	8.50/ 8.75
Light Prints	7.50/ 7.75
No. 1 Washables	5.00/ 5.25
Bleachable Khaki	7.00/ 7.50
Unbleachable Khaki	6.00/ 6.50
Cottonades	5.50/ 5.75

Old Domestic Cotton Rags

(F.o.b. Ship. Pt. Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.50/ $6.00
No. 1 Whites Miscellaneous	4.50/ 5.00
No. 2 Whites Repacked	3.50/ 3.75
No. 2 Whites Miscellaneous	3.00/ 3.50
Blue Overalls	3.75/ 4.00
Thirds and Blues Repacked	3.25/ 3.50
No. 1 Roofing Rags	1.70/ 1.80
No. 2 Roofing Rags	1.60/ 1.70
No. 3 Jute Bagging	1.50/ 1.60
No. 4 Brussels and hard back carpets	1.50/ 1.60
No. 5A Roofing Rags	1.50/ 1.60

New Foreign Cotton Cuttings

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
New Dark Cuttings	$5.50/ $5.75
New Mixed Cuttings	6.25/ 6.50
Light Silesias	9.25/ 9.50
Light Flannelettes	9.25/ 9.50
New White Cuttings	12.00/ 13.00
New Unbleached Cuttings	12.25/ 13.00
Fancy Shirt Cuttings	6.50/ 7.00
Light Prints	7.75/ 8.00
Bleachable Khaki, No. 1	7.00/ 7.50
Unbl. Khaki, No. 1	6.25/ 6.75

Old Foreign Rags

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Linens	nominal
No. 2 White Linens	nominal
No. 3 White Linens	nominal
No. 4 White Linens	nominal
No. 1 White Cottons	8.00/ 10.00
No. 2 White Cottons	7.00/ 8.00
No. 3 White Cottons	6.00/ 6.50
No. 4 White Cottons	4.00/ 4.50
Extra Light Prints	6.50/ 7.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	4.00/ 4.50
Dutch Blue Cottons	5.25/ 5.50
Checks and Blues	4.00/ 4.25
Linsey Garments	2.35/ 2.50
Dark Cottons, European	2.30/ 2.35
Dark Cottons, Egyptian	3.25/ 3.50
Old Shopperies	2.20/ 2.30
New Shopperies	2.25/ 2.30

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$7.25/ $7.50
Domestic Gunny, No. 1	7.25/ 7.50
Heavy Wool Tares	6.50/ 6.75
No. 1 Scrap Baggings	6.00/ 6.25
Roofing Bagging	1.50/ 1.75
Foreign Manila Rope	6.00/ 6.75
Domestic Manila Rope	6.50/ 6.75
Jute Strings	5.00/ 5.25
No. 1 Sisal Strings	5.25/ 5.50
Mixed Strings	1.75/ 2.50

Waste Paper

Base Prices to Mills for Average Packings
F.o.b. New York, Baled

	(Per Ton)
No. 1 Hard White Envelope Cuts	130.00/ 135.00
No. 1 Hd. Wh. Shavings, unruled	120.00/ 130.00
Super Soft White Shavings	115.00/ 125.00
No. 1 Soft White Shavings	100.00/ 110.00
No. 1 Fly Leaf Shavings	45.00/ —
No. 1 Gd'wd Fly Leaf Shavings	35.00/ —
No. 1 Heavy Books & Magazines	19.00/ 21.00
Mixed Books	13.00/ 15.00
No. 1 White Ledger	70.00/ 75.00
Col. Ledger	45.00/ 50.00
Manila Tab. Cards	80.00/ 85.00
New Manila Envelope Cuttings	90.00/ 100.00
Extra Manilas	25.00/ 30.00
Mxd. Kraft, Env. & Bag Cuttings	70.00/ 80.00
Kraft Envelope Cuttings	100.00/ 110.00
Triple Sorted, No. 1 Brown Soft Kraft	50.00/ 60.00
New Kraft Corrugated Cuttings	40.00/ 45.00
No. 1 Assorted Old Kraft	40.00/ 45.00
New Jute Corrugated Cuttings	18.00/ —
Old 100% Kraft Corr. Containers	30.00/ 35.00
Old Corrugated	14.00/ 15.00
No. 1 News	12.00/ 13.00
No. 1 Mixed Papers	7.00/ 8.00
Box Board Cuttings	7.00/ 8.00
White Blank News	65.00/ 70.00
Overissue News	16.00/ 18.00
Mill Wrappers	14.00/ 16.00

Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)	
Coarse Polished—India	.35¼/ .36½
Fine Polished Fine India	.41¾/ .45
Unpolished—Paper Makers	.32 / .35½
Tube Rope	.33¼/ .35¼
Wrapping	.37 / .39
Cotton	.63¼/ .66¾
(Hard Fiber)	
Mex. Sisal	.21 / .27
Manila (Reprocessed)	.30 / .32
(American Hemp)	
Polished Hemp	.36¾/ .60
Unpolished	.32¼/ .54

PHILADELPHIA

Domestic Rags (New)

(F.o.b. Eastern Shipping Point)

Shirt Cuttings—	
New White No. 1	.10½/ .11
New White No. 2	nominal
Light Silesias	.07½/ .08
Black Silesias, soft	.06 / .06½
New Unbleached	.10½/ .11¼
Washable Prints	.06½/ .07
Washable No. 1	.05 / .05½
Blue Overall	.07½/ .08
Cottons—According to grade—	
Washable Shredding	.03 / .03½
Fancy Percales	.06¾/ .07¼
New Black Soft	nominal
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.05¾/ .06½
Bleachable Cotton Cuttings	.06½/ .07
Men's Corduroy	.05½/ .06
Ladies' Corduroy	.05 / .05½
Cottonades	.05½/ .06

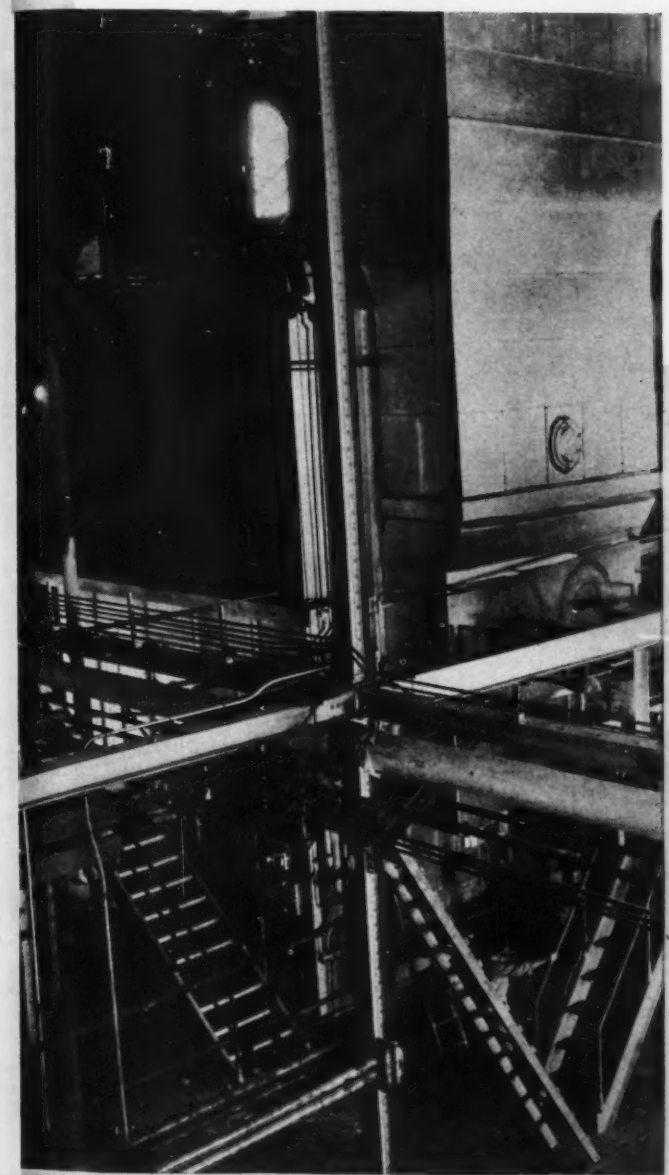
Domestic Rags (Old)

(F.o.b. Eastern Shipping Point)

White No. 1—Repacked	4.50 / 5.00
Mixed White	4.00 / 4.25
White No. 2—Repacked	3.50 / 3.75
Thirds and Blues—	
Miscellaneous	2.50 / 2.75
Repacked	3.00 / 3.25
Roofing Stock—	
Foreign No. 1	nominal
Domestic No. 1	1.65 / 1.70
Domestic No. 2	1.55 / 1.60
Roofing Bagging	1.45 / 1.50
Old Manila Rope	— / 5.75

(*Continued on page 78*)

Alabama Pulp and Paper Company's
NEW KRAFT MILL
served by
B&W BOILERS
and
RECOVERY UNITS



1—Type FH Integral-Furnace Boiler, gas and oil fired, with capacity of 150,000 lb of steam per hr capacity at 475 psi, and 650 F. (Illustrated at left.)
1—Type H Stirling Boiler, bark fired, with capacity of 30,000 lb per hr at 160 psi.
2—B&W Tomlinson 100-ton Recovery Units, with steam output of 90,000 lb per hr at 428 psi.

Supplying all steam for power and processing purposes, and handling all chemical recovery at the recently-completed ultra-modern kraft mill of Alabama Pulp and Paper Co. are the four B&W units listed above. Their selection for this outstanding new unit of St. Regis Paper Co.'s integrated operations near Pensacola, Fla. reflects how completely B&W boilers and recovery units are meeting modern paper mill requirements as to reliability, efficiency, continuity of service, and operating and maintenance economy.

P-31

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N. Y.
WORKS: ALLIANCE AND BARBERTON, O.; AUGUSTA, GA.

FOR PAPER MILLS — B&W Tomlinson Recovery Units, B&W Integral-Furnace Boilers, Type H Stirling and Cross-Drum Boilers, Boiler Components, Pulverizers, Fuel Burning Equipment, Refractories, Process Equipment, Alloy Castings, Seamless & Welded Tubes for all Pressure and Mechanical Applications

PRICES

CONTINUED FROM PAGE 76

Bagging

(F.o.b. Eastern Shipping Point)

Gunny No. 1—	
Foreign	nominal
Domestic	$5.50 / 6.00
No. 1 Clean Bright—	
Sisal Strings	.04½/ .05
No. 2 Clean Bright—	
Sisal Strings	.03½/ .04
Sisal Jute	.02¾/ .03
Scrap—	
No. 1	5.00 / 5.50
No. 2	2.50 / 3.00

Old Papers

F.o.b. Phila. Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00/$115.00
No. 1 Hard White Shavings, unruled	100.00/ —
Soft White Shavings	80.00/ —
White Blank News	65.00/ 70.00
Soft White Shavings, One Cut	/ 80.00
No. 1 White Ledger	65.00/ 70.00
No. 1 Heavy Books & Magazines	20.00/ 22.00
Overissue Magazines	nominal
New Manila Envelope Cuttings	75.00/ —
No. 1 Assorted Old Kraft	35.00/ 40.00
No. 1 Mixed Paper	7.00/ 8.00
Box Board Cuttings	8.00/ 10.00
Kraft Corrugated Cuttings	75.00/ 80.00
Old Corrugated	14.00/ 16.00
Overissue News	13.00/ 15.00
No. 1 News	10.00/ 12.00

BOSTON

Old Papers

F.o.b. Boston, Mill Prices, Baled

No. 1 Hard White Shavings, unruled	$6.25 /$6.75
No. 1 Hard White Shavings, ruled	6.00 / 6.50
Soft White Shavings, Misc.	6.00 / 6.25
No. 1 Fly Leaf Shavings	— / —
No. 2 Fly Leaf Shavings	4.25 / —
No. 1 Grdwd. Fly Leaf Shvgs.	1.75 / 2.00
No. 2 Groundwood Fly Leaf Shavings	1.50 / 1.75
Mixed Colored Shavings	2.00 / 2.25
New Manila Env. Cuts, one cut	4.50 / 4.75
Hard White Envelope Cuts, one cut	7.00 / —
Triple S'ted No. 1 Br. Soft Kraft	3.75 / 4.00
Mixed Kraft Env. & Bag Cuttings	4.00 / 4.25
Kraft Envelope Cuttings	5.00 / 5.50
No. 1 Heavy Books & Magazines	1.75 / —
New Manila Env. Cutt'gs, one cut	2.35 / —
New Manila Envelope Cuttings	4.00 / 4.25
White Tabulating Cards	5.00 / —
Groundwood Tabulating Cards	1.50 / 1.75
White Blank News	2.25 / 2.50
No. 1 Assorted Old Kraft	3.50 / 4.00
No. 1 Mixed Paper	.47½/ —
Overissue News	.90 / 1.00
No. 1 News	.55 / .60
Box Board Cuttings	.60 / .70
New Corrugated Cuttings, Kraft.	2.75 / 3.00
Old Kraft Corrugated Containers	2.00 / 2.25
Old Corrugated Containers	— / 1.10
Jute Corrugated Cuttings	1.07½/ —
Paper Strings	2.00 / 2.25

Bagging

(F.o.b. Boston)

Gunny Bagging—	
Foreign	(nominal)
Domestic	7.00 / —
No. 1 Old Rope	6.25 / —
Mixed Strings	1.50 / —
Transmission Rope—	
Foreign	nominal
Domestic	3.00 / 3.50
Manila Rope—	
Foreign	nominal
Domestic	6.25 / —
Jute Carpet Threads	6.00 / —
Bleachery Burlap	— / 8.00
Scrap Burlap—	
Foreign	6.50 / 6.75
Domestic	6.50 / 6.75
South America	6.50 / 6.75
Wool Tares	
Foreign	7.50 / —
Domestic	7.50 / —
Austr. Wool Pouches	7.50 / —
New Zealand Wool Pouches	5.00 / —
New Burlap Cuttings	7.00 / —
Heavy Baling Bagging	7.00 / 7.50
Paper Mill Bagging	— / 5.00
No. 1 Roofing Bagging	1.75 / —

Domestic Rags (New)

(F.o.b. Boston)

Shirt Cuttings—	
New Light Prints	.07¼/ —
Fancy Percales	.08 / —
New White No. 1	.11 / .11¼
New Light Flannelettes	.08 / .08½
Canton Flannels, Bleached	.10 / .11
Underwear Cutters, Bleached	.11½/ —
Underwear Cutters, Unbleached	.11 / .12
Silesias No. 1	.08 / .08½
New Black Silesias	.04½/ —
Red Cotton Cuttings	.05¼/ —
Blue Overalls	— / .08½
Soft Unbleached	.11 / .12
Blue Cheviots	.08 / .08½
Fancy	.06 / —
Washable	.06 / —
Khaki Cuttings	.06½/ .07½
Corduroy	.04 / —
Men's Corduroy	.04 / —
Khaki Canvas	— / .06
B. V. D. Cuttings	.11½/ —

Domestic Rags (Old)

(F.o.b. Boston)

White No. 1—	
Repacked	5.00 / 5.50
Miscellaneous	4.50 / 5.00
White No. 2—	
Miscellaneous	2.65 / —
Twos and Blues, Repacked	2.75 / —
Old Blue Overalls	4.00 / 4.50
Thirds and Blues, Repacked	2.20 / —
Miscellaneous	1.80 / —
Black Stockings	3.50 / 4.00
Roofing Stock—	
No. 1	1.70 / —
No. 2	1.60 / —
No. 3	1.50 / —
No. 4	1.50 / —
No. 5, Quality A.	1.60 / —
Quality B.	1.50 / —
Quality C.	.95 / —
Old Manila Rope	6.00 / —

Foreign Rags

(F.o.b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F.o.b. Chicago) Mill Prices, Baled

Shavings—	
No. 1 Hard White Envelope cuts, one cut	$120.00/ —
No. 1 Hard White Shavings, unruled	114.00/ —
No. 1 Soft White Shavings	100.00/ —
No. 1 White Ledger	60.00/ 65.00
No. 1 Heavy Books & Magazines	28.00/ 30.00
White Blank News	55.00/ —
Mixed Kraft Env. & Bag Cuttings	80.00/ —
No. 1 Assorted Old Kraft	25.00/ —
Overissue News	20.00/ —
No. 1 News	— / 16.00
No. 1 Mixed Paper	9.00/ —
Old Corrugated	15.00/ —
Mill Wrappers	11.00/ —

MARKETS

Blanc Fixe

Supply good; demand steady. Pulp is currently quoted at $85.00 in bags, car lots at works, 6 cents per pound, l.c.l., deld.; by-product $75.00 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder

Supply adequate. Delivery good. Shortage of shipping containers restricts export. Prices range from $4.25 to $4.75 per 100 pound drums, l.c.l. works.

Casein

Demand continues dull. Domestic supply limited, with shortage foreseen by September. Argentine, domestic firm. Prices softer. Current prices on processed acid precipitated casein at 30 to 31 cents per pound for domestic grades and 25¾ to 26¼ cents for imported grades, f.o.b. shipping point.

Caustic Soda

Liquid supply improved. Dry types continue short with renewed demands likely to tighten situation. Solid caustic is reported at $3.10 per cwt.; flaked and ground is quoted at $3.50 per cwt. in 400 pound drums, $4 to $4.25 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.50 per cwt.; liquid 73 percent in tank cars at $2.60 per cwt.; at works.

China Clay

Demand steady. Supply excellent. Domestic filled clay is $9 to $11.50 per ton, car lots; coating clay is $14 to $22. Imported clay quotation, short tons, $16 to $35, export warehouse.

Chlorine

Supply approximately in balance. Demand due for pickup. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt., in multi-unit tank cars, f.o.b., works.

Rosin

Buying dull. Export inquiry good. K grade upped 5c. Gum rosin in drums per 100 pounds net in car lots, f.o.b. Savannah; B, $6.50; G, $7.25; H, $7,25; I, $7.26; K, $7.33. Wood rosin per 100 pounds net, car lots, f.o.b. Savannah; B, $5.00; FF, $6.50.

Rosin Size

Seventy percent gum and pale wood grades. Supply ample. Demand good. Tank cars, $6.15 to $6.25, f.o.b. southern shipping point.

Salt Cake

Demand continues ahead of supply with slight improvement in shipments. Production under contract. Domestic salt cake quoted at $25 to $28.

Soda Ash

Supply-demand near balance. Deliveries up to schedule. Export likely to expand. Current prices, car lots per 100 pounds; in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

Sodium Bicarbonate

Supply good. Demand easier. Reported at $1.95 per cwt. paper bags, carload lots.

Starch, Corn

Supply good. Demand easier. Prices steady. Record crop forecast. Pearl grade quoted at $6.66 per 100 pounds; powdered starch at $6.77 to $6.81 per 100 pounds; car lots, New York.

Starch, Potato

Supply good with heavy crop forecast. High grade quoted at $6.00 cwt. f.o.b. Idaho, $6.75 f.o.b. Aroostook.

Sulphate of Alumina

Demand increased. Supply steady. The commercial grades are quoted at from $1.50 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

Sulphur

Production shows heavy gain. Prices unchanged. Supplies ample. Annual contracts are quoted at $16 to $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $17.50 to $19.50 per long ton.

Talc

Demand continues far in excess of supply. Prices steady. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in cart lots.

Tapioca Flour

Medium grade in limited supply, low grades adequate. Medium, quoted at $9.25 cwt., low grades, $8.25 cwt., on dock Atlantic and Gulf ports.

Titanium Dioxide

Supply of paper grades continues unequal to demand. Shipments on allocation. Anastase 17½-18c pound carload lots, 18-19c l.c.l., rutile, 19½-20c pound carload lots, 20-21c l.c.l.; 50-pound bags, f.o.b. plant, minimum freight allowance.

PULP

Perkins-Goodwin Co.

ESTABLISHED 1846

30 ROCKEFELLER PLAZA • NEW YORK.

CHICAGO, ILLINOIS

LUFKIN, TEXAS

STOCKHOLM, SWEDEN

PAPER

FINANCIAL RECORD

Preferred Stocks	Per Share Calendar Year 1947	Earnings 12 Mos. to Approx. 6/30/48	Indic. Annual Divid. Rate	Sept. 8 Closing Market Price
Armstrong Cork Co. $3.75 Cum.	$38.64*	$43.53*	$3.75	94
Armstrong Cork Co. $4.00 Cum. Conv.	38.64*	43.53*	4.00	111½
Celotex Corp. 5% Cum.	24.25c	26.25i	1.00	18⅞
Champion Paper & Fibre $4.50 Cum.	65.90h		4.50	96
Container Corp. of Amer. 4% Cum.	102.74	88.25	4.00	
Crown Zellerbach $4.20 Cum.	56.40h	55.07i	4.20	99¾
Crown Zellerbach $4.00 Cum. Conv. 2nd	211.39h	217.70i	4.00	
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	9.16	8.59	2.50	52½
Flintkote Co. $4 Cum.	81.91	80.04	4.00	99½
Robert Gair Co. Inc. 6% Cum.	18.01	16.26	1.20	18⅜
International Paper Co. $4 Cum.	236.51	245.85	4.00	
Johns Manville $3.50 Cum.	128.81	134.48	3.50	
Kimberly Clark Corp. 4½% Cum.	70.03	73.34	4.50	
Kimberly Clark Corp. 4% Cum. Conv. 2nd	95.88	100.73	4.00	
MacAndrews & Forbes 6% Cum.	62.20	62.56	6.00	
Mead Corp. 4¼% Cum.	81.56	79.68	4.25	
Mead Corp. 4% Cum. Conv. 2nd	53.34	51.75	2.00	40
Paraffine Cos. Inc. 4% Cum. Conv.	152.76a		4.00	
Rayonier Inc. $2 Cum.	13.58	15.44	2.00	33
St. Regis Paper Co. 4.40% 1st A	76.93	84.43	4.40	
Scott Paper Co. $3.40 Cum.	43.95	50.24	3.40	
U. S. Gypsum Co. 7% Cum.	211.34	362.32	7.00	
United Wallpaper Inc. 4% Cum. Conv.	(d)	130a	2.00	
West Virginia Pulp & Paper 4½% Cum.	75.75c	78.49i	4.50	
Common Stocks				
APW Products Co.	$1.24	$1.46	$0.25	
American Writing Paper Corp.	1.61	.47	0.25	
Armstrong Cork Co.	6.41	7.17	2.60	52
Celotex Corp.	6.59c	7.15i	2.00	29¾
Certain-Teed Prods. Corp.	3.75	3.92	0.90	16¾
Champion Paper & Fibre	5.57h		2.00	24½
Congoleum Nairn Co.	4.55	5.12	2.00	
Container Corp. of America	10.09	8.50	2.00e	36¼
Crown Zellerbach	6.81h	6.53i	2.00	30½
Dixie Cup Co.	5.87	5.37	1.00	
Flintkote Co.	6.27	5.83	2.50	34⅜
Robert Gair Co. Inc.	2.83	2.59	0.40	7¾
Great Northern Paper Co.	4.56	4.44	2.40	
International Paper Co.	15.02	15.62	4.50	58
Johns-Manville Corp.	3.17	3.28	1.40	35¼
Kimberly-Clark Corp.	4.29	4.52	1.40	22
MacAndrews & Forbes Co.	3.68	3.70	2.50	
Marathon Corp.	3.39c	3.93i	1.40	22⅝
Mead Corp.	7.33	7.10	2.00	19½
National Container Corp.	4.13	3.11	1.20	10½
Paraffine Cos. Inc.	2.40a		1.20	
Rayonier, Inc.	7.30	8.47	1.00	34¼
Ruberoid Co.	10.88	12.13	2.75	
St. Regis Paper Co.	2.66	2.87	0.60e	11½
Scott Paper Co.	3.02	3.49	2.20	
Sutherland Paper Co.	6.87	6.56	2.50	41½
Taggart Corp.	1.29		0.60	
Union Bag & Paper Corp.	7.93	8.35	3.00	34¾
United Board & Carton	4.95b		1.25	11⅝
U. S. Gypsum Co.	10.00	12.49	6.00	104½
United Wallpaper	(d)	0.11a	——	
West Virginia Pulp & Paper	11.40c	11.56i	3.00	

(a) Year ended 6/30/48
(b) Year ended 5/30/48
(c) Year ended October 31, 1947
(d) Deficit
(e) Plus extras
(f) 12 Months to approximately April 30, 1948
(g) Twelve months to approximately 3/31/48
(h) Year ended April 30, 1948.
(i) 12 Months to approximately July 31, 1948
(*) Pro forma

Dividends Declared

Haloid Co. has declared a dividend, payable October 1 to stockholders of record September 15, of 25 cents a share on the common stock and an extra dividend of ten cents a share on the common. A dividend of $1 a share on the four per cent cumulative preferred stock also was declared.

Brompton Pulp & Paper Co., Ltd., reported net income of $899,081 or $3 a share for the six months of 1948, compared with $672,651 and $2.24 a share for like period of 1947.

Carpenter Paper Co. announced issue of 6,117 shares of 4 percent convertible $100 par preferred stock without underwriting, shares to be offered to holders of the company's preferred and common stocks and to certain key employes and officers. Holders of outstanding preferred may subscribe to one share of new preferred for each 20 shares or fractions held, with a five share maximum if 100 shares or less are held. Common stockholders are permitted to subscribe for one share for each 40 or fractional shares held, with a five share maximum to holders of 200 shares or less. Proceeds are to be used for general corporate purposes.

Celanese Corp. of America declared a dividend of 60 cents per share on common stock payable Sept. 30 to stockholders of record Sept. 17. The Board also voted regularly quarterly dividends for the current quarter of $1.18¾ on first preferred, $4.75 series, and $1.75 per share on 7 percent second preferred, both payable Oct. 1 to stockholders of record Sept. 17.

Canadian Celanese, Ltd., declared dividend of 75 cents per share on common stock in respect of the third quarter of 1948. Dividends of 43¾ cents on preferred stock $1.75 series, and 25 cents on preferred $1 series, which shall be deemed to be for the third quarter of 1948 also were declared. All dividends are payable Sept. 30 to stockholders of record Sept. 17.

Celanese Corp. of America reported net income of $11,024,933 after all charges and taxes for three months ended June 30, equivalent after preferred dividends to $1.86 per share of outstanding common stock. This contrasted with net of $9,743,930 or $1.62 in quarter ended March 31, and with $4,852,881 and 74 cents a share for quarter ended June 30, 1947.

Net income of $20,768,862, equal after preferred dividends to $3.49 on common stock capitalization, was reported for first six months of 1948, compared with $11,033,445 and $1.72 for 1947's period.

Celotex Corp. reported net income of $5,020,657 for the nine months ended July 31, equal after preferred dividend requirements to $5.33 per common share outstanding. This compares with $4,507,962 or $4.76 a share for the corresponding period of 1947. Net sales increased to $39,737,020 from $33,432,219 in 1947's period.

Crystal Tissue Co. reported net profit of $91,745 or 88 cents per common share for the first six months of 1948, compared with $110,528 and $1.08 a share for 1947's half year.

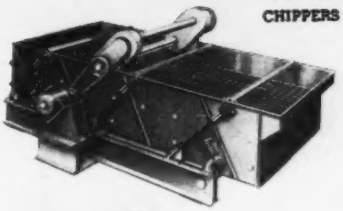
PAPERMILL *and* WOODROOM EQUIPMENT

BACKED BY OVER 60 YEARS EXPERIENCE

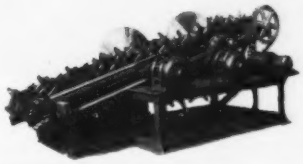
MURCO VERTICAL AXIAL FLOW AGITATOR

MURCO HORIZONTAL AXIAL FLOW AGITATOR

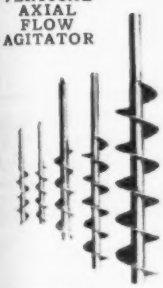
PULPWOOD CHIPPERS



LEVEL VIBRATING DOUBLE DECK CHIP SCREEN



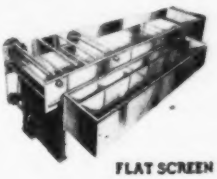
PULPWOOD SLASHERS



SCREW CONVEYORS AND FLIGHTS

KNOT DRILLS

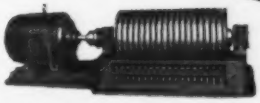
QUICK OPENING GATE VALVE



FLAT SCREEN

ROLL HEADING MACHINES

WINDERSHAFTS



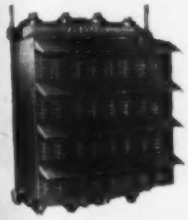
CHIP CRUSHERS

★ Illustrated are some of the better known MURCO Woodroom and Papermill equipment that for years has been serving the paper industry — each item being improved as operating conditions demand more and more production. Complete details on this equipment—or any other woodroom or papermill equipment that you may be planning — will be sent you upon request. Just write for it.

TRADE MARK MURCO REG. U.S. PAT. OFF.

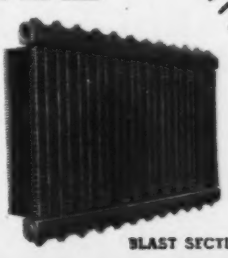
GRID UNIT HEATER *AND* BLAST COILS

High test cast iron heating sections . . . one piece construction . . . no soldered brazed, welded, or expanded connections . . . GRID Unit Heaters and GRID Blast Coils are made to last as long as the pipes furnishing steam to them . . . May be used safely on steam pressure up to 250 lbs.



UNIT HEATER

"lin sections made in one piece



BLAST SECTIONS

D. J. MURRAY MANUFACTURING CO.

WAUSAU WISCONSIN

After 63 years of pioneering

1885—NEW YORK—Original office and factory

1900—BROOKLYN—Major Atlantic Coast factory and laboratory
1914—CHICAGO—Office and warehousing
1921—CICERO—First Mid-West factory and laboratory
1924—BOSTON—Warehousing
1926—PHILADELPHIA—Warehousing
1930—LONDON—Office and warehousing
1931—SAN FRANCISCO—Office and warehousing
1935—SAN FRANCISCO—First Pacific Coast factory and laboratory
1941—PORTLAND, ORE.—Warehousing
1943—LONDON—New office and factory
1947—SAN FRANCISCO—New office, factory and laboratory
1947—ST. LOUIS—Factory
1948—ATLANTA—Warehousing
1948—LONDON—New office and factory
1948—LOS ANGELES—Factory

The original founders of The Arabol Manufacturing Co. set out to produce new, clean, odorless glues—to replace many former applications of animal glues. . . . *Sixty-three years later,* the firm is still pioneering in the making of virtually every type of adhesives.

For many years, Arabol has been privileged to serve the leaders in a hundred industries. In order that Arabol service shall keep pace with customers' needs —new offices and factories, enlarged factories and laboratories and new warehousing facilities have been steadily added.

We are proud of the above record and the facilities they represent. They will be further increased.

We invite the opportunity to serve you. Whether your adhesives requirements are for packaging, converting, labeling, carton or case-sealing, or in the actual manufacture of your wares—it is our aim to provide the one specific adhesive for each application.

THE ARABOL MANUFACTURING CO.

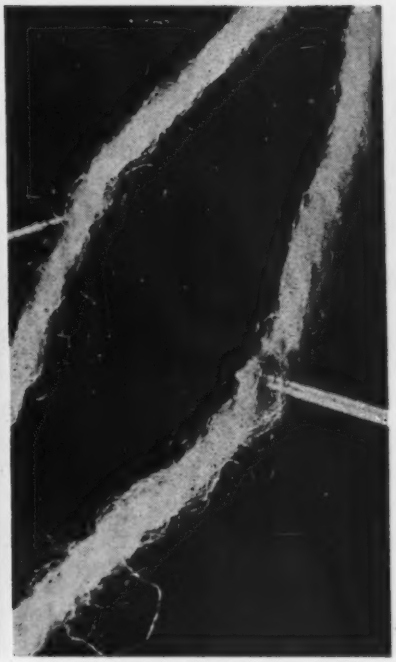
Executive Offices: 110 East 42nd St., New York 17, N. Y.
CHICAGO 50 — 1835 S. 54th Ave. • SAN FRANCISCO 3 — 1950 16th St.
LOS ANGELES 11 — 2262 E. 37th St. • ST. LOUIS 4 — 2500 Texas Ave.
BOSTON 9—12 Commercial Wharf • PHILADELPHIA 47—600 S. Delaware Ave.
ATLANTA 3—91 Haynes St., N. W. • PORTLAND, ORE.—1233 N. W. 12th Ave.
LONDON E. C. 1—8 Sans Walk, Clerkenwell

Adhesives?... **ARABOL!**

(A) Treated Wool Fiber

(B) Untreated Wool Fiber

(C) UNTREATED wool yarn tangles and fluffs, which leads to early matting and slower drainage.



(D) CHEMICALLY-TREATED wool yarn holds its shape and in a felt stays open and porous longer.

LESS MATTING — LESS WASH-UP

Like a pig's tail, a fiber of wool tends to curl. Treat it chemically and it becomes fairly straight. *(Photos A and B)*

Group many woolen fibers to form a strand and they'll curl, intertwine, and tend to mat when untreated—or stay fairly straight and remain open and more porous when treated. *(Photos C and D)*

Therein lies the difference between standard and chemically treated felts (Orr-Chems). That's why Orr-Chems—

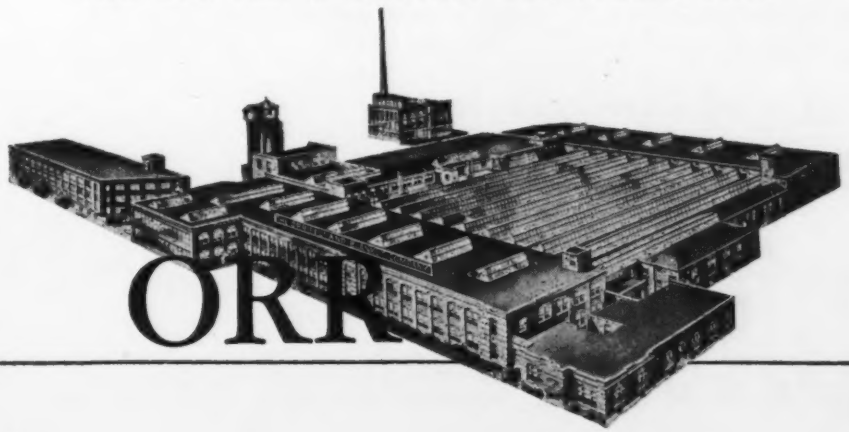
(a) Go on easier; (b) Set to the machine more readily; (c) Permit machines to reach top speeds sooner; (d) Have high drainage characteristics; (e) Mat far more slowly; (f) Force the machine down for wash-ups far less frequently.

Mills interested in more satisfactory felts from the operation standpoint, in felts that cost less per ton of production, should line up with the many mills already using Orr-Chem felts.

ORR FELT LINE, A COMPLETE LINE:

- STANDARD ORRS—untreated felts
- ORR-CHEM FELTS—chemically treated
- COTTON WARP for cement and asbestos products

THE ORR FELT & BLANKET CO., PIQUA, OHIO



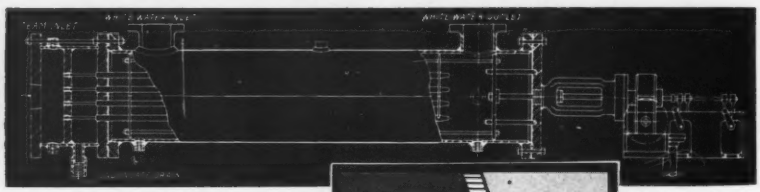
ORR

AT LAST IT'S HERE!

.....CONTINUOUS
WHITE WATER HEATING
WITH NO SHUTDOWNS
FOR CLEANING.....

Paracoil Automatic SELF CLEANING WHITE WATER HEATER

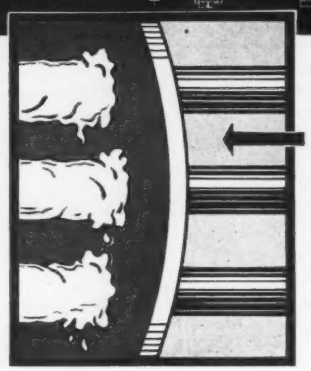
Specially Designed for the Paper Industry



HOW IT WORKS

The transverse heater baffles, which also serve as tube surface cleaners, are connected by tie rods to the yoke plate, which in turn is connected to the drive mechanism at the right. The time controls close the motor circuit at predetermined intervals. The yoke plate moves each baffle longitudinally along the tubes, until the drive mechanism reverses the action and returns the baffles to their original position.

Available in models for either manual, electric motor or hydraulic piston drive. Automatic types operate on adjustable predetermined time schedules.



BAFFLES MOVE FORWARD AND BACKWARD LEAVING TUBES CLEAN AS A WHISTLE

A BATCH OF MANUAL TYPE SELF CLEANING HEAT EXCHANGERS READY FOR SHIPMENT.

Every Inch of Every Tube Is Thoroughly Cleaned At Every Cycle!
100% Heater Capacity Available At All Times!
Standby Heating Equipment No Longer Needed!
Old Style Heater Cleaning Costs Forever Banished!

DAVIS ENGINEERING CORPORATION
1064 East Grand Street
Elizabeth 4, New Jersey
30 Rockefeller Plaza, New York 20

OBITUARY

Albert Newcombe

Albert Newcombe, 69, retired president of the Perkins-Goodwin Co., New York City, died at his home in Calais, Maine, on September 1. A paper mill engineer, Mr. Newcombe had been treasurer and a director of the Southland Paper Mills, Inc., at Herty, near Lufkin, Tex., since its inception in 1940.

He began his career at the Lake George mill of the International Paper Co. at Ticonderoga, N. Y., in 1900.

In 1906 Mr. Newcombe reorganized a lumber concern, the Finch-Pruyn Co., at Glens Falls, N. Y., and designed and constructed for it a paper mill. Three years later he organized and built the Tidewater Paper Mill in Brooklyn.

Mr. Newcombe resided from 1914 to 1917 in England, where he was associated with the late Lords Northcliffe and Rothermere, newspaper publishers, in procuring newsprint. After his return to America, he was an organizer and officer of the Newcombe-Hawley Co., a wood pulp concern, which became the United Reproducers Co., early manufacturer of radio loudspeakers from wood pulp.

In 1934 Mr. Newcombe joined the Perkins-Goodwin concern, being named a director in 1937 and a vice-president in 1942. He retired from the company last year.

Surviving are his widow, Mrs. Peggy Newcombe; a daughter, Mrs. D. Moreau Barringer of Philadelphia; a son, George Newcombe of Llewellyn Park, West Orange, N. J.; and two sisters, Mrs. John O'Connor and Mrs. Whitfield Pressinger of New York.

Samuel Burton Clark

Samuel Burton Clark, 71, former master mechanic of the St. Regis Paper Co. mill at Deferiet, N.Y., died on August 29 at his home after an illness of three years. A papermaker by trade virtually all his life, Mr. Clark was employed in paper mills in Fort Fairfield, Sherman and Millinocket, Me. He became master mechanic at the St. Regis mill in 1920 and held the position for 25 years.

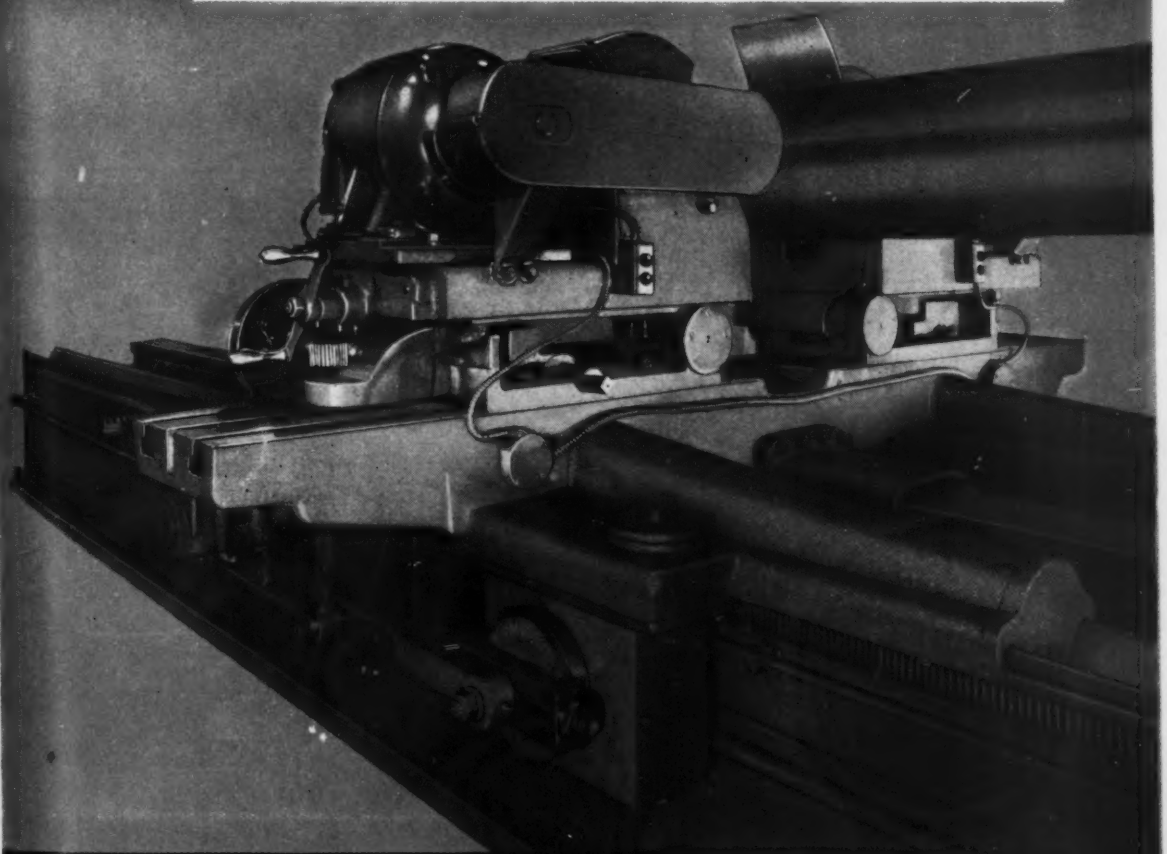
William E. Stewart

William E. Stewart, 67, of South Glens Falls, N. Y., for 40 years a paper maker for Finch, Pruyn & Co., Inc., died in Glens Falls Hospital on August 31. Mr. Stewart, who retired in 1945, was president for two years of the village of South Glens Falls.

LOBDELL

improved PAPER MILL ROLL GRINDER

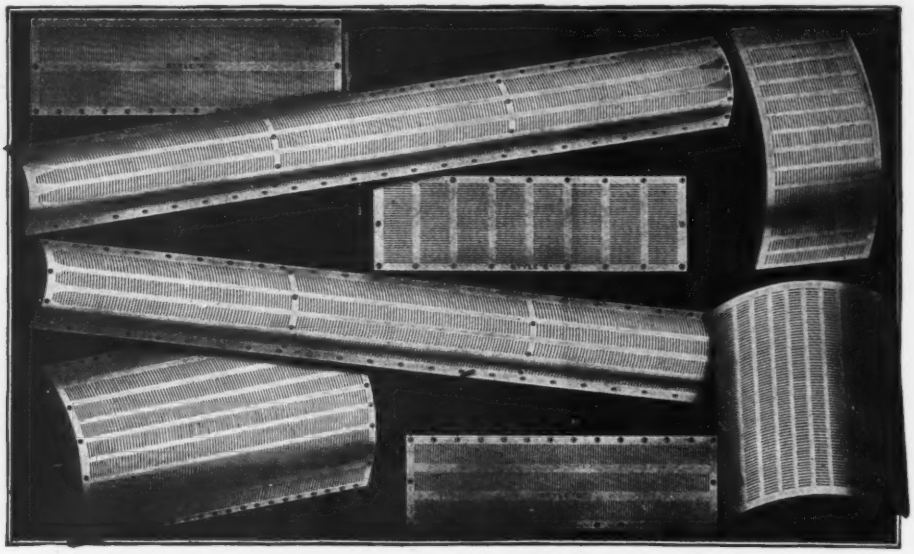
New Low Head Wheel Carriage reduces vibration . . . assures greater accuracy, higher finish on face of your rolls. Operator can maintain closer check on grinding operation. Rolls can be moved in and out faster and easier. Write for details.



LOBDELL COMPANY *ESTABLISHED 1836* WILMINGTON 99, DEL.

EXPORT DEPARTMENT

767 DREXEL BUILDING, PHILADELPHIA 6, PA., U. S. A. CABLE ADDRESS: LOBDELLEX



"HARDY" BRONZE and CHROME-NICKEL-STEEL SCREEN PLATES.

MAGNUS METAL CORP. FITCHBURG, MASS

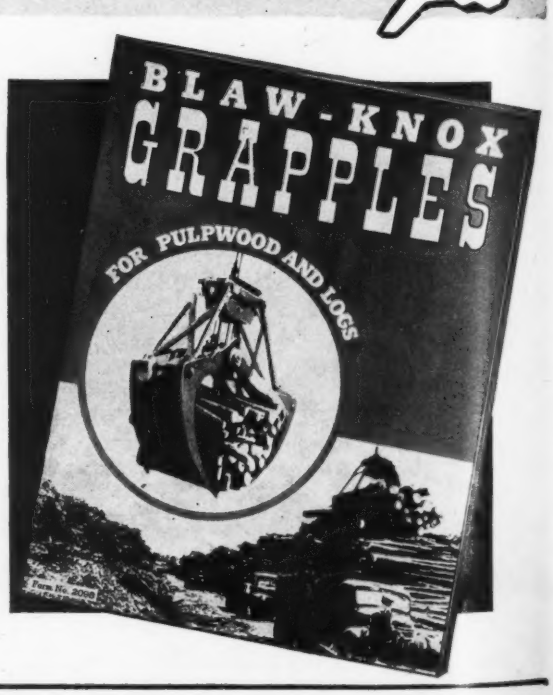
YOU'LL WANT THIS INFORMATION BEFORE YOU BUY

For fast unloading and handling of pulpwood, for symmetrical stacking or rehandling from corded piles—you'll find the size and type you need in this new Bulletin on—

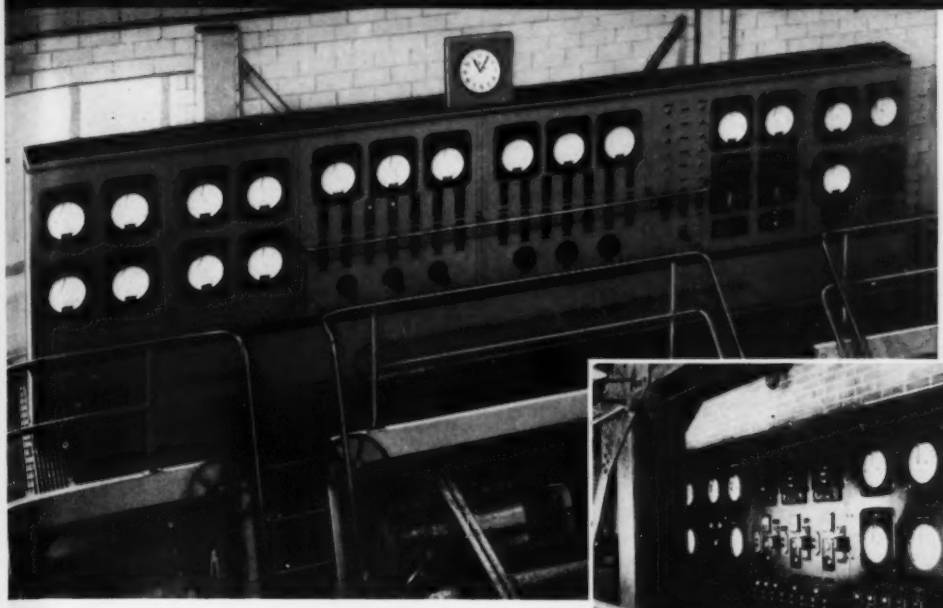
BLAW-KNOX GRAPPLES

It is complete with photos, diagrams, specifications and performance data of interest to anyone concerned with pulpwood handling. Before you decide on your next purchase write for Bulletin No. 2098.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2055 Farmers Bank Building, Pittsburgh 22, Pa.

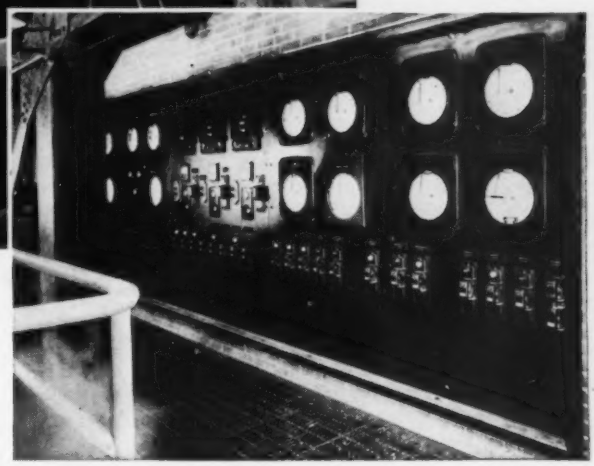


for CLEANER PULP . . . GREATER CHEMICAL RECOVERY . . . EASIER OPERATION . . . and TOP EFFICIENCY



Left: one of the latest Foxboro pulp washer control systems . . . in a new kraft mill.

Below: another Foxboro installation . . . with a long and successful record of operation . . . in one of the world's largest pulp mills.



. . . install FOXBORO Pulp Washing Control

• Cleaner, more uniformly washed pulp, *plus* greater chemical recovery are yours with a Foxboro Control System on the job. Equally important are the lighter work load for your operators, and the smoother, more efficient functioning of your equipment, when the major variables are controlled by Foxboro Instrumentation.

Here's what you get with this Foxboro engineered pulp washer control . . .

1 *A record of blow tank level.*

2 *Uniformly-controlled consistency of pulp from blow tank.*

3 *Controlled flow of pulp from blow tank with an accurate record for accounting purposes.*

4 *Controlled flow of hot water and liquor to showers of each washer.*

5 *A record of level in each filtrate tank.*

6 *Controlled addition of water to washed stock . . . thus assuring more uniform consistency in washed stock chest. Also, a record of stock chest level.*

7 *A record of flow and density of liquor to evaporator.*

This Foxboro system conveniently centralizes pulp washer control in a compact, modern cabinet . . . greatly simplifying installation, operation and servicing. Except for simple external connections, all piping and wiring is expertly engineered at Foxboro.

Consider the advantages of this instrumentation for your mill. Whatever the make of your washing equipment, IMPCO, OLIVER, SWENSON-NYMAN . . . there's a Foxboro control system designed especially for it. Similar Foxboro systems are helping to maintain top washing efficiency in mills throughout the U. S. and Canada. Several have been in operation over 10 years. Write for complete information. **The Foxboro Company, 11 Neponset Ave., Foxboro, Mass., U. S. A.**

FOXBORO Engineered CONTROL

REG. U. S. PAT. OFF.

the Corporation President

WHO ALMOST SLEPT TOO LONG

T. M. Stanton* was having a nightmare. For months he'd been preoccupied with the production problems of Empire Gadgets, Inc. So preoccupied, he'd even half-admitted to himself that he was devoting far less thought to national problems than a leading citizen should. But the urgency of his immediate interests kept shoving these concerns into his subconscious mind. Now they were torturing his sleep.

"T. M., old boy," one spectre was saying, "how would you like a nice black depression to come along and swallow up your whole company?" And a green-eyed ogre leered, "While you're neglecting your free-enterprise system, we're moving in with *another* system!"

Stanton's body lurched. "No!" he thundered. Awakened, he scratched his head, murmuring, "Gad, what a dream! H-m-m—wonder what sort of contribution I ought to be making . . ."

Here's Something, Mr. President, You Ought to Do Right Away!

Check up on the status of the Payroll Savings Plan in your company. By making U. S. Savings Bonds easily available to your employees "on the installment plan," it benefits not only the employees but your business and the nation as well! Here's how:

(1) The Payroll Savings Plan builds financial security for each participant. The Bonds pay $4 at maturity for every $3 invested.

(2) The experience of 19,000 companies operating the Payroll Savings Plan shows that it makes employees more contented in their jobs—cuts down absenteeism—even reduces accidents!

(3) The Plan helps to spread the national debt and thus helps secure your business future. How this works is clearly and briefly described in the free brochure shown below.

Why Executive Backing Is Vital

Employees still want the benefits of the Payroll Savings Plan. In fact, they *need* the P. S. P., because banks don't sell Bonds on a partial-payment plan—which is the way most workers prefer to buy them. But war-time emotional appeals are gone. Human nature being what it is, the success of the Plan in your company is liable to dwindle unless a responsible executive *keeps promoting it.*

So—today—*check up* on the status of the Payroll Savings Plan in your company. *Act* on your responsibility to see that it is vigorously maintained.

The State Director will gladly help.

Be sure to read this! *"The National Debt and You," a 12-page brochure, brings you the views of W. Randolph Burgess, Vice Chairman of the Board of The National City Bank of New York —and of Clarence Francis, Chairman of the Board, General Foods Corporation. Request your copy from the Treasury Department's State Director, Savings Bonds Division.*

**This one is fictitious—but it might be any corporation president.*

The Treasury Department acknowledges with appreciation the publication of this message by

PAPER TRADE JOURNAL

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

Goerl Writing Paper Survey

NEW YORK—Preliminary analysis of the results of a nationwide writing paper survey reveals that some of the nation's largest users of business letterheads are not sufficiently informed about the difference in types, grades, and brands of writing papers. The survey, which is part of a general investigation of the fine paper market conducted by Stephen Goerl Associates, was designed to reveal: (1) How many large concerns buy and specify paper for their letterheads? (2) How many select from printers' samples? (3) How many use cotton content papers, and what percentage of the total used? (4) What are the deciding factors in purchasing or selecting paper for letterheads, and what is their order of importance? (5) Which cotton content brands can the purchasers name without the use of reference material? (6) Which other grades can they name?

Tabulation and analysis of the replies is under way and when completed the results will serve as a guide in the merchandising and promotion of writing papers. "Even a cursory glance at the replies makes it glaringly obvious that a great deal of confusion exists in the minds of the respondents as to the fiber content and the manufacturer's identity or brand name of the bond papers they use," Stephen Goerl disclosed to *Paper Trade Journal*.

The survey was directed exclusively at companies which employ buyers of printing, and has thus included many of the country's largest industrial, mercantile, financial, and other private organizations. While many of these professional buyers of paper are apparently well-informed about the various types, grades, and brands of writing papers, a surprisingly large number frankly admit that they cannot name any brand. Others list sulphite brands as cotton content papers and can name only one brand, in the great majority of cases the same widely advertised make.

Fires Menace Maine Woods

PORTLAND, Maine—A five-day-old fire in the woods at Mount Abram, Franklin County, was the most serious of about a dozen blazes in Maine on September 1, according to the State Forestry Commission.

Drought and high winds have put general fire conditions into the perilous Class 4, but diminishing winds were reducing some of the danger, the commission reported.

At Ogunquit, in York County, four departments were called to prevent spread of a cottage fire to the woods near by.

Westport Island, opposite the mouth of the Sheepscot River, near Wiscasset, experienced a fire similar to that at Dark Harbor.

The Mount Abram fire destroyed 3,000 cords of pulpwood owned by the Oxford Paper Co. and burned over almost 500 acres of timberlands.

Other fires were reported at Palermo, China, Chelsea, Baker Mountain, Dedham, Gray, Bar Mills, Waldoboro and Farmington.

Bar Mills is in the York County area which was ravished by fire last October.

Dr. Morgan to Mathieson

NEW YORK—Dr. D. P. Morgan, who recently joined the Mathieson Chemical Corp. as administrator of research and development, has been appointed vice-president in charge of the development department, Thomas S. Nichols, Mathieson president and board chairman told *Paper Trade Journal* on September 3.

Before coming to Mathieson, Dr. Morgan was in charge of chemical market research and development at W. R. Grace & Co. During the last several years of World War II, he served as director of the Chemicals Bureau of the WPB. Prior to that he was associated with Scudder, Stevens & Clark as a chemical consultant.

ECA Sept. 3 O-Ks

WASHINGTON—Additional authorizations under the ECA program of foreign aid announced September 3 included $71,000 worth of bleached sulphite wood pulp, high alpha quality, to be procured in the United States for shipment to France. For ocean transportation, an additional $8,000 was authorized.

The day's authorizations also included $605,000 worth of chemicals for the Netherlands, to be procured in the United States, comprising among other items, soda ash, caustic soda, synthetic resins and molding powders, and others.

Export License Validation

WASHINGTON—Details of the new export license validation stamp, authorized by the Office of International Trade, were announced September 2.

All export licenses issued by OIT after September 1 must bear the new stamp, it was ordered recently.

The stamp is a three-color reproduction of the official seal of the Department of Commerce, together with the words, "Office of International Trade Validated." The validation date follows, in a fourth color.

Cigarette Paper Snafu

WASHINGTON — Dollar exchange shortage precludes any immediate extension of the United Kingdom's import trade in cigarette paper from the United States, the Department of Commerce was advised by the Embassy in a report in late July, it was stated last week.

The United Kingdom's output of cigarette paper in 1947 dropped to 114,000 hundredweight (112 pounds each) from 140,000 in 1946, and 120,000 hundredweight, prewar. This compared with an estimated consumption last year of 120,871 hundredweight.

France was the principal pre-war source of British cigarette paper imports, furnishing 86 percent of the total annual imports immediately prior to the war. The Embassy report cited the shortage of dollar exchange as blocking any immediate change in this situation.

In the Union of South Africa cigarette paper consumption is estimated at about 80,000 bobbins, supplied entirely by imports of which the United States supplied last year, $363,000 worth, compared with $133,000 in 1946. The United States market there has grown from a relatively negligible start in 1940, it was pointed out. However, no immediate increase in such demand is expected as the requirements in the Union appear to be met satisfactorily.

Mexico Paper Output Up

WASHINGTON—Mexico's paper industry operated at full capacity during 1947, it was reported here last week. The facilities operated three eight-hour shifts daily, producing 105,728 metric tons of paper and paperboard, a considerable climb from the 95,443 tons reported in 1946. The 1948 output is estimated at 136,383 tons.

Tartacovsky Visiting U. S.

NEW YORK—Dr. M. Tartacovsky of Cairo, Egypt, who has been the representative in that area for the past ten years for the Crown-Zellerbach Corp., has informed *Paper Trade Journal* that he intends to make a business tour of the United States in the immediate future to establish personal contact with his paper industry friends.

Dr. Tartacovsky, a member of the Egyptian Ass'n. of Paper Importers, founded the paper import firm which bears his name in 1930. Previously, from 1925 to 1930, he was manager of the export department of Paper Mills Gebr. Schmitz, A.G., of Marken, Germany. He holds a M.A. degree in economics from the University of Frankfurt, Germany.

On Revillagigedo Island

The site of the mill to be built by the Ketchikan Pulp & Paper Co., at Ward's Cove is on Revillagigedo Island. Ward's Cove is six miles north of the town of Ketchikan, Alaska. The company is a subsidiary of the Puget Sound Pulp & Timber Co. Controlling stockholder in the Puget Sound company is the American Viscose Co.

ECA Aids Canada

TORONTO — Authorizations for procurement in Canada, as of August 25, under ECA, totaled $199,696,293. Over and above this there were general authorizations, Canadian and U.S., shown as a source of supply, for $10,318,048. It is probable that a good percentage of this amount will be allocated to Canada. ECA authorizations in the pulp and paper field included: Wood pulp, $5,871,000; pulpwood, $140,000; lumber, $13,000,000.

another outstanding ROSS Equipped machine

Southern Paperboard Corporation

View of Ross Air Systems from dry end showing hood on dryers between calenders as well as main hood over machine; also heating and ventilation to roof. *Photo—Courtesy Pusey & Jones Corporation.*

We take pride in the fact that Southern Paperboard Corporation's impressive new mill at Port Wentworth, Ga. is equipped with the most modern types of Ross Air Systems. Main dryers and calender dryers are fitted with Ross Hoods and Exhaust Systems. Proper roof heating and ventilation is achieved with a Ross System embodying special Diffuser outlets. Other Ross Systems supply air for bottom felt, air makeup and calender cooling. In the Washer Room, a Ross Hood and Exhaust system has also been installed over the pulp washers.

The industry's finest mills are Ross Equipped mills!

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Aerial view of Southern Paperboard Corp. mill at Port Wentworth, Ga.

Southern Paperboard Corp. Port Wentworth, Fla., Mill

By E. P. McGinn

The new kraft mill of the Southern Paperboard Corp., at Port Wentworth, Ga., is the result of years of planning and investigation of numerous possible locations. Then followed the acquisition of woodlands sufficient to insure continuous operation of the mill. The present site was originally chosen several years ago but uncertainty of the water supply caused a postponement of the plans to build there and brought about consideration of other locations in Georgia.

In 1945 the City of Savannah decided to build a large water plant which would have enough extra capacity to supply a pulp and paper mill with a minimum of ten million gallons per day. This removed the only obstacle to the construction of the mill at its present location. This site of 180 acres is about seven miles northwest of Savannah on the Savannah River.

Engineering and planning from the inception of the project was under the direction of D. G. Moon of the J. E. Sirrine Co., Greenville, S. C. Construction of the mill was started in November, 1946, by the Daniel Construction Co., Greenville, S. C.

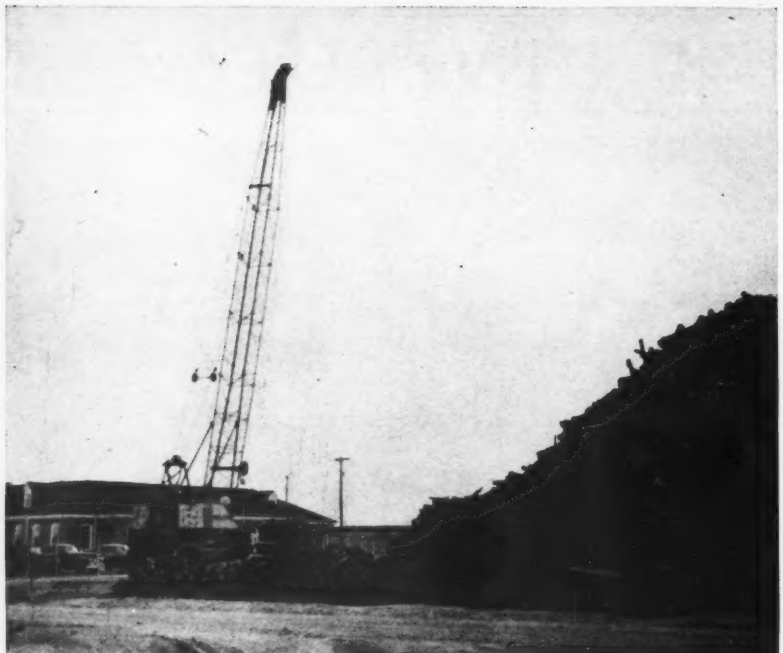
There are 13 buildings, so arranged as to allow straight line production with a minimum amount of handling of material. The ground area of these buildings is 270,000 square feet and the total volume exceeds ten million cubic feet. Most of the buildings are steel frame with concrete foundations, floors and beams. The walls are mostly of brick with corrosion-proof steel sash. The roofing is precast light concrete slabs with insulation where necessary.

Woodyard

The woodyard was designed to receive four-foot pulpwood from barges, trucks and railroad cars. The wood is stacked beside the truck road and two long railroad sidings. Two conveyors run parallel to the railroad sidings.

The wood is unloaded from the railroad cars by large grab cranes and from the trucks by cranes with cable slings. The entire truckload is removed at one operation.

The yard has a storage capacity of



Crane unloading pulpwood from trucks. Office building in background.

about 20,000 cords of four-foot wood and is so arranged that the older wood is always removed first. Hardwood and pine are stored separately.

From the storage yard the wood is carried by the two conveyors, which run parallel to the railroad tracks, to the two barking drums, each of which is 12 feet in diameter and 45 feet long. These drums are of the M-bar type, built by the Fibre Process Co., Chicago.

The barked wood is delivered to a sorting conveyor where the unbarked wood is returned to the barkers and the clean wood is sent to the chippers. These 88" ten-knife machines were supplied by the D. J. Murray Mfg. Co., Wausau, Wis. The chips then go to storage and feeder bins from which they pass to a belt conveyor which carries them to the main storage bins.

The wood preparation and cooking and washing systems are arranged to handle two kinds of wood simultaneously. Thus each barking drum may be fed by two conveyors from the woodyard and the wood from each barker will go separately to its own chipper and thence to any of the six chip bins in the chip storage house. These chip storage bins will hold almost a thousand cords of wood in chip form, enough for more than 24 hours of operation. The chips are removed from the bins by special feeders to a high speed conveyor belt which carries them through a Merrick weightometer and then directly to the digesters, there being no storage in between. The feeders are so arranged that chips may be fed from any bin or from combinations of several bins.

Railroad sidings and pulpwood conveyor.

The Merrick weightometer makes it possible to have a constant chip quantity in each digester charge and thus to help maintain uniform quality of pulp. This equipment weighs the chips as they are being conveyed to the digester by means of a device which multiplies quantities of conveyor load and conveyor belt speed. The machine then automatically totalizes the products and registers the result on a dial at the machine and also by remote control at other places, if desired. Usually the machine is set up to deliver a predetermined quantity of chips to the digester and then automatically stop the flow.

Digesters

The digesters are housed in a building 114 feet long by 29 feet wide by 72 feet high. An elevator runs from the basement to the operating floor, which is about 50 feet above the ground. The six digesters are of welded steel, 9½ feet in diameter by 47 feet high, each having a volume of 3,320 cubic feet and producing ten tons of pulp per cook. These digesters were built by the Chicago Bridge & Iron Works and are equipped with Yarnall-Waring blow valves operated by Cutler-Hammer remote control systems. Complete automatic cooking control is provided by Foxboro instrumentation.

The digesters may be blown into either of the two blow tanks and the system is arranged to handle two kinds of pulp separately. The steam from the blow tanks passes through a waste heat recovery system provided by the Fibre Making Process Co. The recovered heat is used to supply hot water for pulp washing.

Washing & Screening

The screen and washer building consists of two parts, the latter being 82 by 61 by 72 feet high and the former being 80 by 114 by 45 feet high. Here again there are two complete systems for both washing and screening. Vibrating type pre-knotters are placed ahead of the washers to form a better mat on the washer cylinders and thus improve washing efficiency. The rejected knots are reduced in a Noble & Wood knot grinder and then returned to the system.

The washing system consists of one line of four vacuum washers each with cylinders 8 feet in diameter by 14 feet long and a second line of three washers, each with cylinders 8 feet in diameter by 10 feet long. All washers were supplied by Improved Paper Machinery Co.

The washers are set at the same level as the operating floor of the digester building which is about 50 feet above the ground level. Suction for the

washers is supplied by drop legs extending down to horizontal cylindrical black liquor tanks on the ground level.

The washers are provided with Ross Hoods for removal of vapor and are completely equipped with Foxboro instruments to regulate consistency and meter incoming stock and to control the amount of water in the washed stock.

An overhead crane is provided to facilitate repair and maintenance of the washers. The operating floor is closed-in and conditioned, whereas the underlying section has canopy ventilated walls.

The washed stock discharges into two storage chests equipped with propellor type agitators and each having a capacity of 15 tons of stock at five percent consistency.

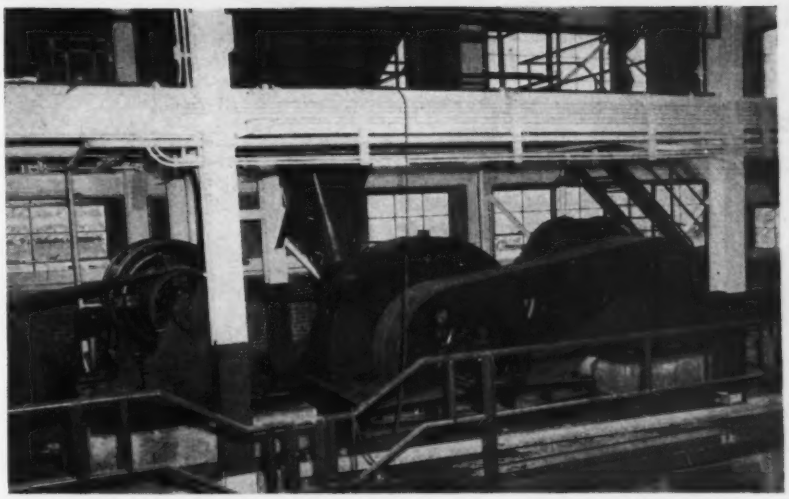
Screen Room

The stock from each of the above chests passes through consistency regulators and metering boxes before being diluted to proper consistency for screening. There are six Impco centrifugal screens so arranged that they may be divided in any proportion to handle the two types of pulp. The screen rejects from the two systems are combined and sent to another centrifugal screen similar to those above. The final rejects from this screen are sent to a thickener. The thickened material flows to a surge chest from which it is pumped to a Sprout-Waldron disc refiner. The refined tailings are then mixed with the primary liner stock in the washed stock chest.

The accepted stock from the two screening systems flows by gravity to a group of three Impco vacuum deckers, each 8 feet in diameter by 12 feet in length. Normally, one of these deckers handles the hardwood stock and the other two are used for the pine pulp. White water from each decker is carried by its vacuum leg to separate storage tanks each of which is equipped with its own white water pump for recirculation.

Recovery System

The buildings housing the recovery system consist of the recovery building which is 77 feet by 90 feet by 90 feet high, and the slaker house and causticizing building having a total of about 1200 sq. feet floor area.



Eighty-eight inch, ten knife Murray chipper. Motor of record chipper shown at left.

The initial stage of recovery consists of collection of the black liquor, which after being removed from the pulp by the vacuum washers, drops to the two horizontal storage tanks. From here it is pumped to the two black liquor storage tanks each 30 feet in diameter by 32 feet in height. From these tanks the black liquor is continuously pumped to the General American sextuple effect evaporator.

Black liquor soap, skimmed from the liquor surface in the foam tanks, is fed with the black liquor through the first few effects of the evaporator and then removed to a tank where the final soap is skimmed off and stored for shipment to be purified and sold as tall oil.

The evaporators are located in the open, immediately outside the recovery building. Stainless steel tubes are used in the first two effects to resist the corrosion of the strong black liquor. Ordinary steel tubes are used in the other stages.

The salt cake used for make-up is removed from freight cars to storage bins by means of a Brady pneumatic conveying system. These conveyors are also used to carry the salt cake to the mixing tanks where it is dissolved in the black liquor going to the recovery furnaces.

Before passing to the furnaces the thick black liquor goes through a cascade evaporator which is heated by the combustion gases from the furnaces. Each of these recovery units is equipped with a Cottrell precipitator and syntron vibrator to remove the suspended chemicals from the combustion gases. The two recovery furnaces, built by the Combustion Engineering Co., are of the latest spray type, each having a capacity to burn 27,000 lbs. of solids per hour. Each boiler has a capacity of about 100,000 lbs. of steam per hour. The temperature of 700°F and pressure of 625 PSI are the same as the power plant boilers.

The smelt from the recovery furnaces drops into enclosed dissolving tanks where it dissolves in weak liquor recovered from the causticizing system. The green liquor thus formed is pumped to two storage tanks each 36 feet in diameter by 24 feet high. The liquor is then sent to a tray type clarifier, 35 feet in diameter by 24 ft. high. The mud from this clarifier is washed

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Chipper house at extreme left. Conveyor and elevator carry chips to storage bins at right.

Causticizing system at left. Digester building and turpentine storage tank at right.

with weak liquor to recover the soda therein.

The complete causticizing system was built by the Dorr Co., and includes the green and white liquor tray type clarifiers; two causticizing tanks each 12 feet in diameter by 12 feet high; the two green liquor storage tanks; two white liquor storage tanks, each 36 feet in diameter by 24 feet high; a lime slaker and classifier, and a lime mud storage tank 20 feet high by 20 feet in diameter.

The milk of lime, which is formed in the slaker by the addition of burned lime to weak liquor, is passed through the classifier and then pumped to the causticizing tanks. Here it reacts with the sodium carbonate in the green liquor to form caustic soda and calcium carbonate sludge or lime mud. The mixture passes to the tray type clarifier where the white liquor is decanted to storage tanks. The lime mud is sent to a storage tank from which it then goes to two six-by-six foot cylinder type vacuum filters. After thorough washing on these cylinders it is delivered to the lime kiln for reburning.

The lime kiln is 300 feet long by eight feet in diameter and is oil-fired. The kiln is equipped with a scrubber to collect the suspended solids from the gases. These are dissolved or suspended in weak liquor and returned to the system. In addition to the lime which is recovered and reburned in the kiln there is a small amount that is lost in the process. The make-up may be added to the lime mud as limestone and burned in the kiln or it may be added to the slaker as quicklime.

Weak liquors collected from various washings throughout the recovery system are stored in a tank 36 feet in diameter by 24 feet high. This weak liquor is used for washing and dissolving in place of water.

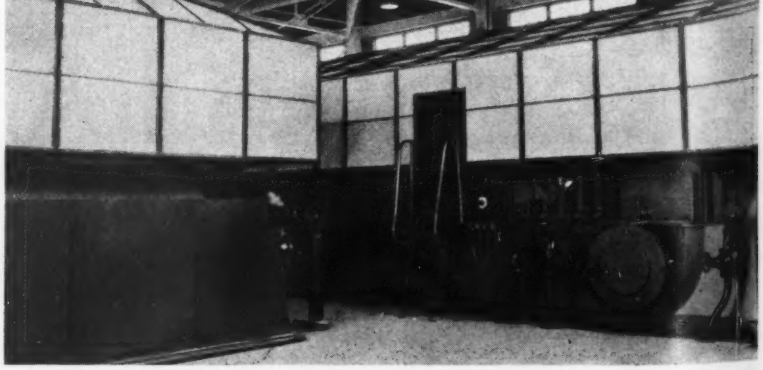
Paper Mill

The separation between pulp mill and paper mill in an integrated system is rather indefinite, but we may consider the stock preparation system as the first unit in the papermaking system. The stock preparation building which houses the Jordans and stock chests is 180 by 64 by 55 feet high. Most of the basement floor is occupied by stock chests and pumps. The operating floor, which is about 18 feet above the basement, holds the 14 Jones Majestic Jordans that prepare the stock for the paper machine.

At this point we have a type of stock separation which has no relation to the previous separation of hardwood and softwood pulps. The new separation is based on different degrees of beating of the stock for the primary and secondary headboxes. Both the primary and secondary stocks are usually mixtures of the hardwood and softwood pulps.

Before going to the jordans each of the stocks passes through a De Zurik consistency regulator.

Eight of the 14 Jones Majestic jordans are used on the primary stock which constitutes about 80 percent of the total furnish. Three jordans are used for the secondary stock which of course, is much slower than the primary stock. After jordanning, each stock flows to its own machine chest. The primary stock is now pumped from its machine chest through regulators and thence through two machine jordans and is then mixed with dilution water before passing to the Ingersoll-Rand primary fan pump. This pump, which is perhaps the largest in operation on any paper machine, has a maximum capacity of 40,000 GPM. It is



At left is shown the third cylinder of the three-stage vacuum washer system. The third and fourth cylinders of the four-stage system are shown at right.

equipped with a 400 HP variable-speed motor. The discharge of this pump is 42" in diameter.

In a similar manner the secondary stock is pumped from its machine chest through consistency and weight regulators, thence through one machine Jordan before being diluted and entering the secondary fan pump. This pump has a capacity of 10,000 GPM.

A separate chest is also provided for hardwood pulp with provision for separate refining and final combining of the different pulps before entering the fan pumps.

The piping on the Jordans is designed to allow the greatest flexibility of arrangement. Almost any combination or series-parallel grouping may be obtained.

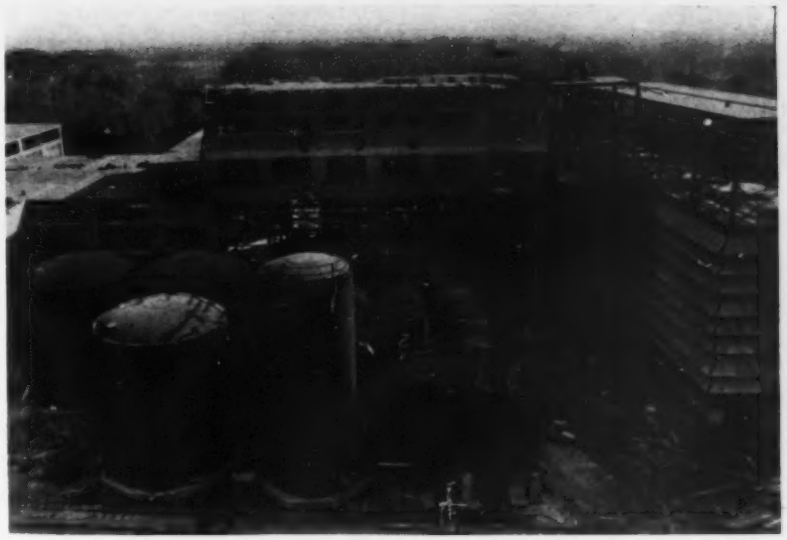
Both rosin size and alum are brought to the mill in liquid form in tank cars and stored in large cylindrical tanks outside the stock preparation building. Two wooden tanks are used for the alum and two steel tanks are used for the 70 percent rosin size. The size is diluted before being added continuously after the jordans.

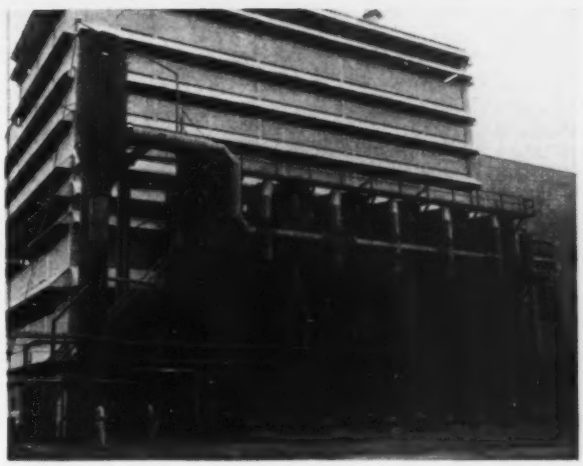
Paper Machine Building

The paper machine and finishing room are housed in a single building 75½ feet by 630 feet by 55 feet high. There are two full floors, these being the basement and operating floors. The latter is approximately 18 feet above the former. There is also a mezzanine floor containing the exhaust fans. It is about 16 feet above the operating floor and a smaller platform floor is located 27 feet above the operating floor. The machine room is equipped with a 35-ton Northern crane running the full length and width of room. This crane is equipped with two trolleys, each having a lifting capacity of 17½ tons. There are also two 15-ton trolley cranes which run from the railroad tracks through the machine shop and into the paper machine room. The paper machine is equipped with a 15-ton Northern crane for transferring rolls from the reel to the winder.

In the machine room basement near the dry end of the paper machine there is a Lobdell roll grinder capable of handling the 236" long rolls of the paper machine.

The paper machine itself represents Pusey & Jones' most modern design and construction and is one of the largest units to be installed in the South for the production of kraft liner board.





Left — Black liquor storage tanks. Right —Blow tanks and digester building.

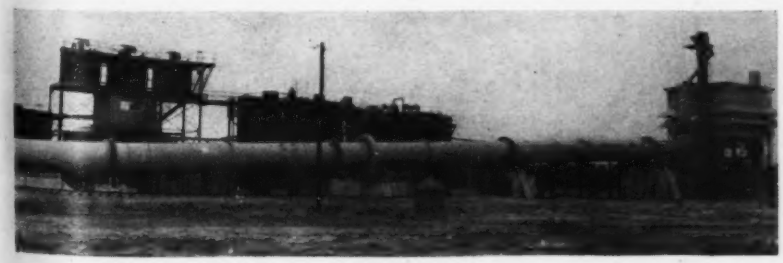
General American sextuple effect evaporator. Recovery building in background.

The machine is designed to operate at a maximum speed of 1,600 feet per minute with a maximum trim of 220 inches.

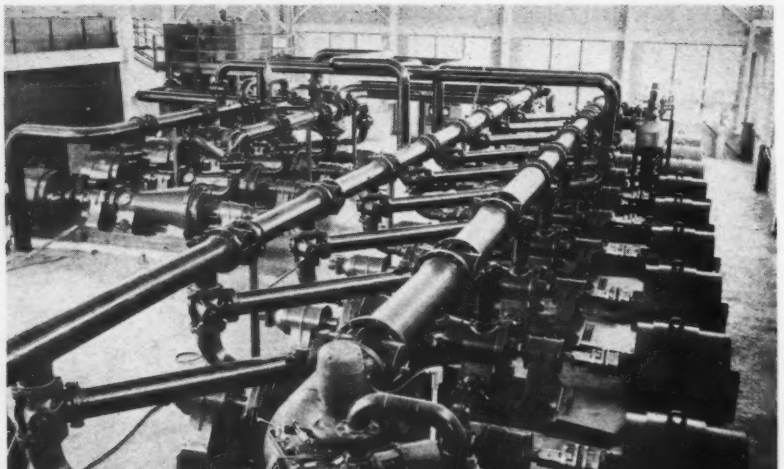
Some idea of its size may be visualized from the illustrations, also from the fact that 112 railroad cars were required for transportation. The machine comprises seven sections consisting of stock entrance unit, Fourdrinier part, press section, dry part, calender section, uniform speed reel, and slitter and winder. The overal length of the machine from head box to winder is 425 feet.

The stock entrance unit comprises an extra-large fabricated steel Neoprene lined head box and 10 ft. high adjustable slice for delivering the stock to the Fourdrinier wet end. The primary head box is arranged with five compartments having a special distributor roll in four of the compartments. The stock is handled by the 40,000 G.P.M. fan pump previously mentioned discharging into a 42" diameter pipe having three branches which connect to the manifold of the inlet compartment in the head box through nine multiple inlets, each with variable control from the machine room floor.

The Fourdrinier part consists of a 236" width wire x 120 ft. long, arranged for use of a Sales auxiliary head box for applying a top liner of stock to the main sheet. Such a large wire naturally requires the most efficient means of installation and this is taken care of by a Rapi-drape wire changing device with all the operating mechanism located along the back side and providing more convenient tending operation. This method, now gaining in favor over other methods, does not require removing the Fourdrinier



Traylor Engineering Co., lime kiln.



All of the 14 Jones Majestic Jordans are shown here.

proper from operating position during the entire wire change. No portable or swinging beams are required in the tending aisle and it is unnecessary to disconnect the shake mechanism, suction boxes or shower pipes. The Fourdrinier is equipped with 28″ diameter bronze shell breast roll, Micarta bladed forming board, 10½″ diameter rubber covered table rolls, full complement of table roll deflectors, 10- 12″ Monel suction boxes with improved type flexible discharge connections, 15¾″ diameter Monel covered return wire rolls, 24″ diameter dandy, stainless steel save-all pans, duplex shake mechanism and adjustable mechanism for changing the pitch on the wire over a range with breast roll 4″ below to 10″ above the guide roll.

The suction couch roll is 44″ in diameter and is equipped with double suction box, the first of his type to be used in this country on a machine for making kraft liner board. In connection therewith is an upper lump breaker or rider roll 18″ in diameter, rubber covered, equipped with pneumatic loading device and supported from the adjacent press framing by a quick handling arrangement so that it is unnecessary to remove the lump breaker roll when installing new wires.

A high pressure shower, controlled and operated by a photo-electric eye, is provided between the couch and first press felt for breaking down the sheet when a break occurs in the dryer section.

The press section is arranged with 2- 36″ diameter rubber covered suction press rolls with 30″ diameter rubber covered upper rolls, the latter arranged with pneumatic loading and lifting mechanism. The Pusey & Jones "Simplex" arrangement is employed, requiring minimum space and providing short draws, and reducing to a minimum the time and labor required for installing new felts. The felt rolls are all 14⅛″ diameter, rubber covered, with one worm roll, motor-operated stretcher and automatic guide for each felt. Motor-operated oscillating doctors with Lodding flexible holders for each upper press roll. The sheet leads from the

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14 JONES MAJESTICS installed at OUT

Jones

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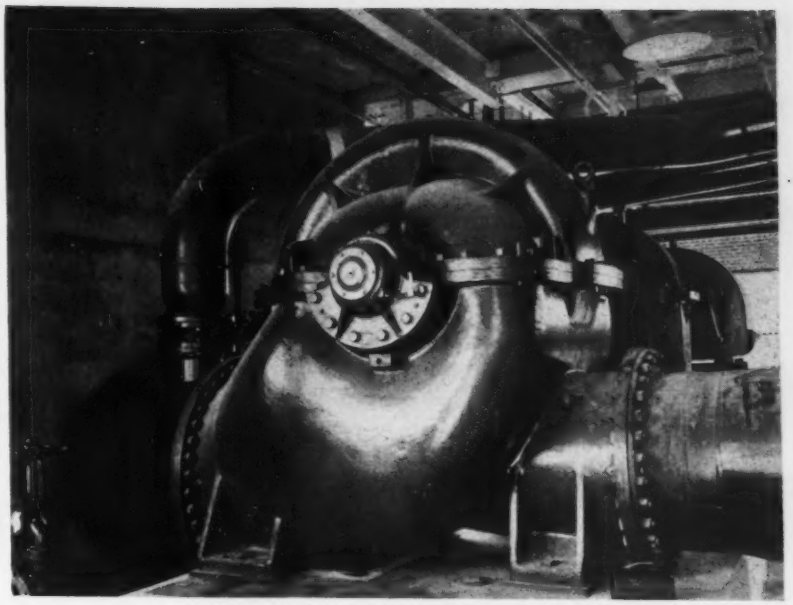
Builders of Quality Machinery for Paper Mills

UFACTURERS AND DISTRIBUTORS IN CANADA. WATEROUS LTD., BRANTFORD, ONT.

second press nip to the dry part over a 16¼" diameter Monel covered receiving roll equipped with auxiliary drive.

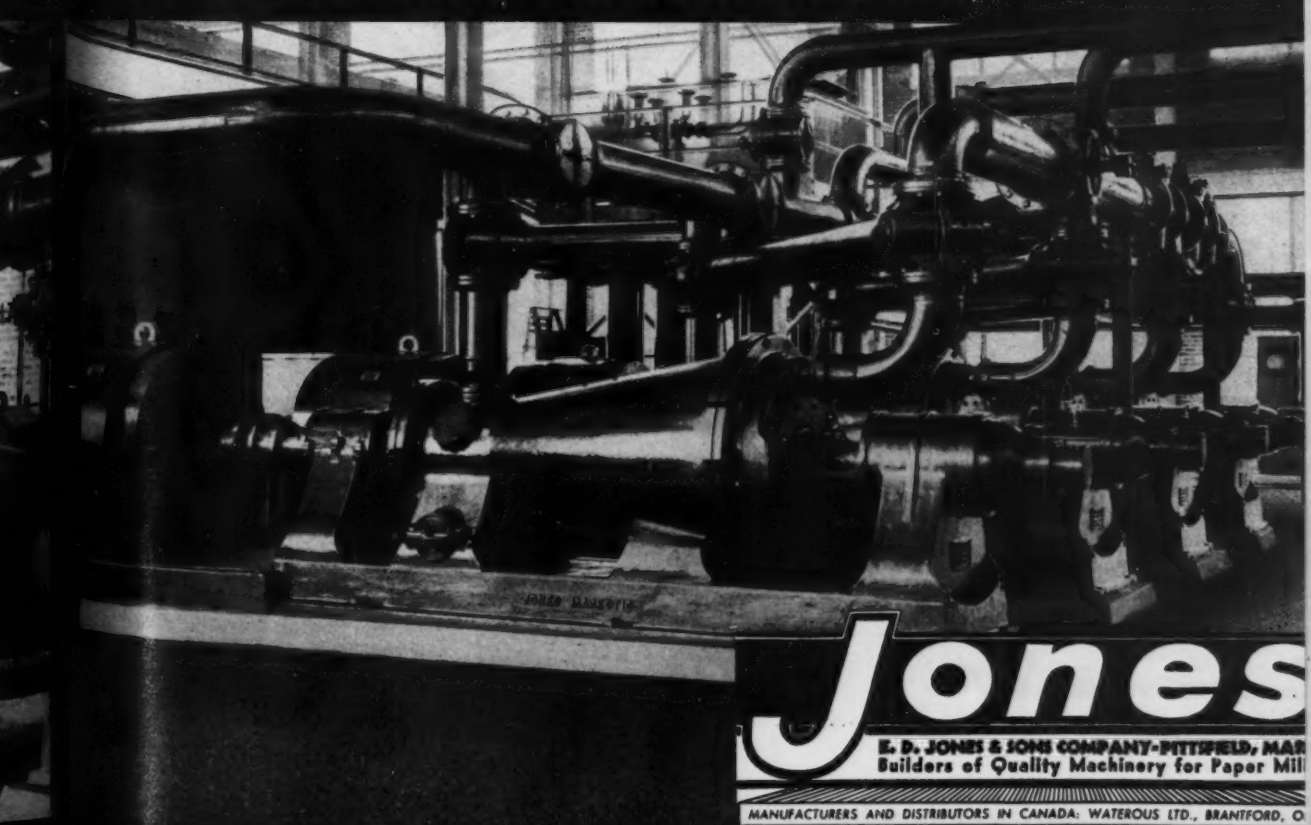
The dry part consists of a total of eighty 60" diameter paper dryers and sixteen 60" diameter felt dryers arranged in four sections with eight felts. The dryers are all designed and constructed for 60 lbs. working steam pressure and tested and certified by the Hartford Steam Boiler Inspection & Insurance Co. Each dryer is equipped with a dual type revolving siphon, also baffles attached to the inside of the shells to assist in removal of condensate. Puseyjones improved steam joints are supported directly from the combination gearing enclosure and back frames, having all the steam and water risers permanently attached to the steam joint supports. The drive gearing is totally enclosed with dryer bearings located outside the gears for quick removal and replacement. All gears are continuously lubricated while running by overflow from the main dryer bearings with direct feed at critical points. The felt carrying rolls are of turned steel 13⅞" and 15⅞" diameter, and each felt is equipped with automatic felt guide and automatic motor-operated tension type felt tighteners. A total of 20 Lodding doctors with flexible holders and bronze blades is provided for location on such lower and upper dryers as preferred. A complete rope carrier system is provided for handling the sheet through the four dryer sections, having special wide flanged sheaves attached to the tending side of each paper dryer and with the return of the ropes located in the basement. The oiling system is of the latest Bowser type for lubrication of all dryer bearings, idler gear bearings, driving pinions and such felt roll bearings as are supported in the back framing. A 12¾" diameter Monel covered spring roll is provided for leading the sheet from the last upper dryer to the first calender stack.



The 40,000 GPM Ingersol-Rand fan pump.

The calender section comprises two 8-roll stacks with equipment for water finish, including three 60" diameter pa-

at: OUTHERN PAPERBOARD CORPORATION, Port Wentworth, Ga.



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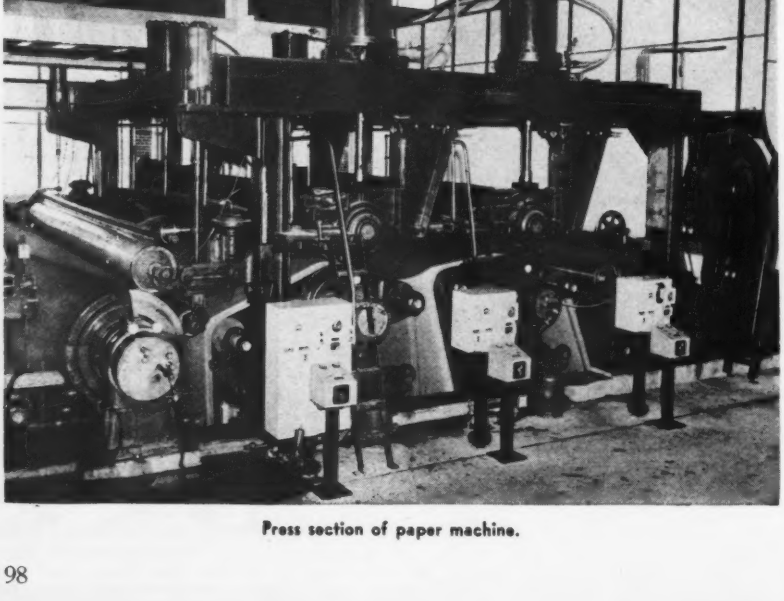
Pusey & Jones Fourdrinier, showing secondary handbox.

per dryers located between the stacks, all served by a separate Bowser circulating oiling system. The bottom calender rolls are 34" diameter with 20" diameter next bottom and 16" diameter upper rolls. Each upper roll is equipped with pneumatic loading device. Lodding doctors are provided with bottom doctors squipped with motor-operated oscillating device.

The uniform speed reel is equipped with a motor-operated transfer device and air-regulated winding controls. The reeling cores are 15⅞" diameter and the whole design provides for reeling a roll up to 88" diameter maximum. A rubber covered crowned spread roll, also rope carrier device are employed to lead the sheet from the calender stack into the reel.

From the uniform speed reel, the reels are transferred to a set of unwinding stands attached to an electric regenerative braking unit for operation in connection with the winder drive.

The slitter and winder are of Puseyjones latest high speed board type for rewinding rolls up to 72" diameter, with 21" diameter grooved main drums and 15⅞" diameter paper lead rolls. A 13⅞" diameter rider roll with pneumatic lift and motor drive assists in the starting and winding of the required jumbo rolls. The slitters are of shear cut type, the upper pneumatically equipped for disengaging by remote control and the lower individually motor driven. Improved type ejector device and roll unloading table operated hydraulically are provided along with special shaft handling mechanism for speeding up the operation.



Press section of paper machine.

All rolls and rotating parts throughout the machine are equipped with heavy duty roller bearings with exception of the bottom calender roll. All such parts are dynamically balanced at speeds up to 1,600 ft. per minute and the winder at 4,000 ft. per minute by means of the latest type Gisholt dynetric balancing machine.

As the rolls come from slitter and winder they are weighed on a floor scale somewhat wider than the paper machine. From the scales, the rolls pass immediately to an elevator which carries them to the floor below, where they are carried to storage or to railroad cars by lift trucks. The elevator has a 10-by-24 foot platform with a capacity of 12 tons and is capable of handling a lift truck with full load.

Rolls for rewinding are carried by crane to the rewinder which accommodates rolls up to 100 inches in width. The rewound rolls are then returned to the elevator.

A completely equipped machine shop and storeroom is located in a building

extending from the finishing room to the railroad. This building, called the shop and stores building, is 108 feet by 114 feet by 42 feet high. The first floor is occupied by the general mill stores and washrooms. The next floor, which is 15 feet above the storeroom contains the machine shop.

Power Plant

The power plant building, located near the recovery building, consists of four rooms as follows: Boiler room 93 x 108 x 67 feet high; turbine room 60 x 80 x 40 feet high; pumps and heater room 44 x 54 x 40 feet high and a small one-story transformer room containing about 870 sq. feet.

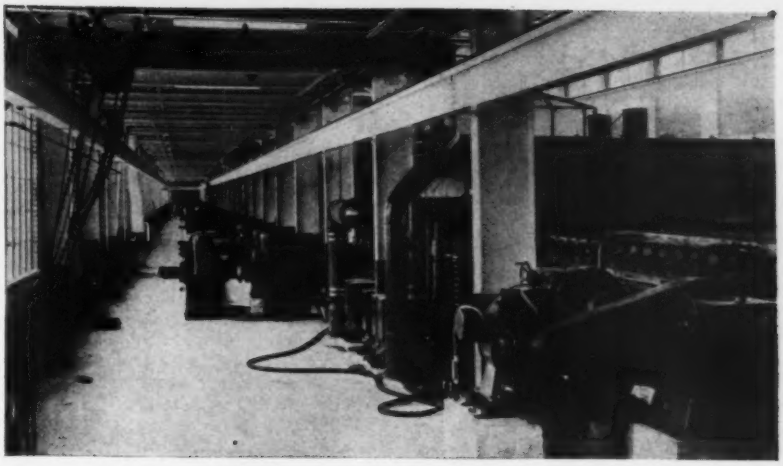
The main boiler plant together with the recovery furnaces provide all the steam for power, process and heating. A total of five boilers, all built by the Combustion Engineering Co., and all quite similar in size and general design produce this steam. Although the boilers are quite similar, the furnaces differ quite widely, as two are recovery furnaces, one a refuse burner and the other two are oil-fired. The two recovery boilers each produce about 100,000 lbs. of steam per hour. The refuse boiler is equipped with a Hofft furnace for burning bark, sawdust or other combustible material. This furnace may also be fired with oil or a combination of oil with bark etc. When fired with bark and sawdust it is expected to produce about 95,000 lbs. of steam per hour, but when fired with oil it can produce as much as the regular oil-fired boilers, or 120,000 lbs. per hour. The latter boilers are so designed that they can burn oil or powdered bituminous coal. Oil for the furnaces and for the lime kiln is received by barge and pumped to a storage tank, 50 feet in diameter by 37 feet high with a capacity of about 525,000 gallons. From this tank the oil is pumped to two smaller measuring tanks, one near the boiler house and the other near the firing end of kiln. All five boilers are equipped with superheaters and produce steam at 625 PSI and 700° F.

The furnace gases and other products of combustion from all five boilers discharge into the large radial brick stack which is 250 feet high and 14 feet in diameter at the top. This stack was built by the Alphonse Custodis Co., and is equipped with the most modern type of aircraft warning lights.

Steam Turbines

There are two 6,000-KW steam turbine generators both of the most modern design, built by Westinghouse. These two machines are identical except that one is non-condensing and the other is equipped with a condenser. Steam is supplied to both turbines at 675 PSI and 700°F. It is extracted from the first turbine at 150 PSI and exhausts at 50 PSI. Steam from the second turbine is extracted at 50 PSI and exhausts through the condenser at 27½ inches of mercury.

Each of the generators produces 6,000 KW at 4,160 volts, three-phase, 60 cycles. All A.C. motors of 200 H.P. or larger use this current directly. For smaller motors this current is stepped down in one of the several transformer substations to 440 volts, three phase, 60 cycles.



Back of paper machine, showing General Electric sectional drive.

The high voltage distribution radiates from the generator room and is controlled from that point. All of these controls are completely enclosed in metal clad switchgear. The outgoing circuits go to substations located in the various manufacturing departments. These substations are used as load centers and house the controls for the low voltage equipment.

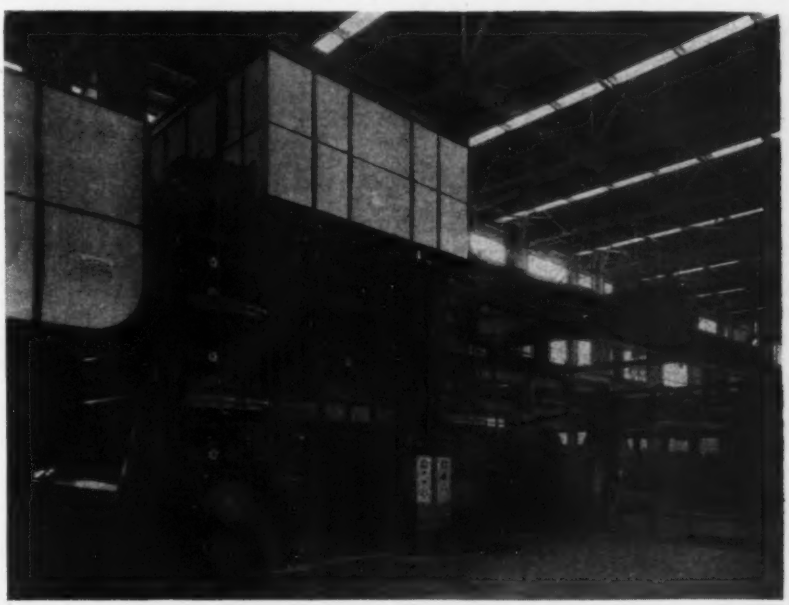
Full voltage magnetic starters, equipped with oil immersed contacts and high interrupting capacity, current limiting fuses and mounted in self supporting steel enclosures are used for the high voltage motors. The 440 starters are air circuit breaker magnetic type and are grouped together in steel enclosed motor control centers.

Remote control push button controls are placed at each machine for the use of operating personnel. The equipment in the control rooms is handled by electrical maintenance personnel only.

Although the total installed motor capacity in the mill is 22,000 H.P. the load at any given time is not expected to exceed 12,000 KW. Connection to a commercial electric power supply has been made to provide current during emergency or maintenance shutdowns of the power plant.

Pump House

A one-story brick building with reinforced concrete floors located near the river houses the two 5,000 GPM water supply pumps and the two 1,000 GPM fire pumps that take water from the Savannah River. One of the fire pumps



Dry end of the paper machine, showing calenders, reel, winder and slitter.

is equipped with a gasoline engine for emergency operation.

The water taken from the river is unfiltered and is used only for washing wood, cleaning up, condenser cooling, fire protection, etc. Clean pure filtered water for process use is obtained from the Savannah Industrial and Domestic water supply system. The water is delivered at 25 PSI in a 20 inch pipe line from the new filter plant. Part of the supply is passed through the turbine condenser and then boosted to 50 PSI for mill use. A small pipe line from the filter plant provides water for drinking.

A large water tank 149 feet from the ground provides water for the underground loop fire system. This tank, which was built by the Chicago Bridge & Iron Works, has a capacity of 100,000 gallons.

Waste from the mill is disposed of through two main trunk sewers to the Savannah River.

Wood Operations

The procurement of sufficient pulpwood for a mill as large as Southern Paperboard is such a tremendous undertaking that a separate corporation was set up to do the job.

The Gair Woodlands Corp., under the direction of T. W. Earle, its president, was organized in March 1946. Since that time the organization has acquired more than 175,000 acres of woodland in Georgia, Florida, North Carolina and South Carolina. It is estimated that the present holdings will supply enough pulpwood on a sustained yield basis to produce about 250 tons of unbleached kraft pulp per day. This amount of wood is approximately half of the requirements of the Port Wentworth mill. The additional 120,000 cords required will be purchased from farmers and other local producers.

The acreage now under control of Gair Woodlands gives no indication of the probable future extent of its holdings. The acquisition of woodlands and acreage for planting is a job that will probably never be completely finished.

During the past year Gair Woodlands planted about 600,000 trees and this rate will be increased as fast as additional seedlings may become available. This year most of the reforestration was done with a Lowther tree-planting machine. With the help of this machine four men can plant an average of 10,000 trees per day.

The four-man crew consists of a tractor driver; the planter, who inserts the seedlings at the proper time; a helper, who keeps the planter supplied with individual trees; and a fourth man, who brings bundles of trees to the machine and helps keep the lines straight. The accompanying illustrations show how this planter is used.

General Information

A completely equipped laboratory with facilities for maintaining full technical control of both pulp and paper mill operations is located near the center of the plant. The laboratory staff is under the direction of Claude Adams, chief chemist.

The main office building is built in the Williamsburg style of architecture and contains 10,000 square feet of floor area. It is located at the entrance gate on the north side of the plant site. The first-aid room, clock room and watchman's office are adjacent to the entrance gate. A large parking lot near the office is provided for the use of employes.

Ample consideration has been given to employes' comfort in the distribution of locker rooms, rest rooms and lavatories located at convenient points throughout the mill area.

A cafeteria will be built adjacent to the mill area.

Officers and Management

George E. Dyke, president of the Robert Gair Co., parent corporation of Southern Paperboard, is chairman of the board of the latter. The other officers of Southern Paperboard are as follows: Ernest Rossiter, president; T. Raymond Pierce, vice-president; T. W. Earle, vice-president; E. O. Sommer, comptroller; E. Meyer, treasurer; W. F. Howell, secretary; William Bergman, assistant comptroller; A. J. Bauser, assistant treasurer; R. B. Trotman, assistant secretary; and H. W. Borman, assistant to the president.

Equipment and Material Suppliers

Allis-Chalmers Mfg. Co. *Chip Screen.*
Atlas Portland Cement Co. *Cement.*
Augusta Iron Works. *Log and Chip Conveyors.*
Bell Lott Road Machinery Co. *Truck Crane (Link Belt).*
Bird Machine Co. *Felt Conditioners.*
The Brady Conveyors Corp. *Salt Cake and Lime Handling Equipment.*
Bridgeport Safety Emery Wheel Co. *Knife Grinder.*
Cameron Machine Co. *Rewinder.*
Chain Belt Co. *Log and Chip Conveyors.*
Chatham Paper & Supply Co. *Plumbing Supplies.*
Chicago Bridge & Iron Co. *Digesters; Elevated Water Tanks.*
Combustion Engineering Co. *Boilers: Recovery, Refuse and Oil Burning.*
Crane Co. *Plumbing Supplies; Valves.*
Alphons Custodis Chimney Construction Co. *Stack.*
Cyclone Fence Co. *Fencing.*
Detroit Steel Products Co. *Sash.*
DeZurik Shower Co. *Consistency Regulators; Valves.*
Diamond Iron Works, Inc. *Hog for Refuse.*
Dorr Co. *Causticizing System.*
Earl Paint Co. *Paint.*
Elliott Co. *Feed Water Heater.*
Fairbanks, Morse & Co. *Scales.*
The Falk Corp. *Speed Reducers.*
Fibre Making Processes, Inc. *Drum Barkers; Digester Blow Down System; Turpentine Condenser.*
General Electric Co. *Paper Machine Drive; Main Switchgear and Transformers.*
B. F. Goodrich Co. *Conveyor Belting.*
Goulds Pumps, Inc. *Feed Water Pumps.*
Hall Steel Co. *Reinforcing.*
Harbison-Walker. *Refractories.*
The Hofft Co., Inc. *Bark Stoker & Bin.*
Hajoco Co. *Plumbing Supplies.*
Improved Paper Machinery Corp. *Black Liquor Washers; Thickeners; Foam Breakers; Knotters; Centrifugal Screens; Agitators.*
Ingalls Iron Works. *Blow and Storage Tanks; Structural Steel.*
Ingersoll-Rand Co. *Fan Pumps; Stock, Liquor and Water Pumps.*
E. J. Jones & Sons Co. *Jordans.*
O. G. Kelley & Co. *Liquid Alum Tanks.*
La Bour Co., Inc. *Stock, Liquor and Water Pumps.*
Link-Belt Co. *Water Intake Screen.*
Lobdell Co. *Roll Grinder.*
Lunkenheimer Co. *Valves.*
Manning, Maxwell & Moore. *Cranes.*
J. R. Martin Co. *Roofing.*
Merrick Scale Mfg. Co. *Weightometer.*
Midwest-Fulton Machine Co. *Condensate Return System.*
Midwest Piping & Supply Co. *Piping*
Monarch Elevator & Machinery Co. *Elevators.*
Morris Machine Works. *Stock, Liquor and Water Pumps.*
D. J. Murray Mfg. Co. *Chippers.*
Nash Engineering Co. *Vacuum Pumps.*
Noble & Wood Machine Co. *Knot Grinder.*
North Bros. *Insulation.*
Northern Engineering Works. *Cranes.*
Ohio Locomotive Crane Co. *Locomotive Crane.*
C. C. Pacotti & Co. *Roofing.*
Poreto Mfg. Co. *Roofing.*
Pusey & Jones Corp. *Paper Machine.*
Research Corp. *Precipitators.*
J. O. Ross Engineering Corp. *Hoods and Fans.*
Shartle Bros. Machine Co. *Broke Beater.*
Sprout, Waldron & Co. *Screenings Refiner.*
Sullivan Machinery Co. *Mill Compressors.*
Taylor Forge Co. *Flanges.*
Tennessee Coal, Iron & Railway Co. *Steel Sheet Piling.*
Traylor Engineering & Mfg. Co. *Lime Kiln.*
United Refractories Co. *Insulation.*
U. S. Rubber Co. *Roll Covering.*
Viking Pump Co. *Soap Pumps.*
Walworth Co. *Valves.*
Waterville Iron Works. *Re-Chippers.*
Westinghouse Electric Corp. *Steam Turbines; Condenser; Motors and Controls.*
Wilfley Pump Co. *Liquid Alum Pumps.*
Worthington Pump & Mach. Corp. *Stock, Liquor and Water, Fire, Pumps; Recovery "Puff System" Compressors.*
Yarnall-Waring Co. *Blow Valves.*

F. M. P. EQUIPMENT IN SOUTHERN PAPERBOARD MILL

2—12′ x 45′ BARKING DRUMS

1—BLOW STEAM HEAT RECOVERY SYSTEM

1—TURPENTINE RECOVERY SYSTEM

F. M. P. EQUIPMENT IN ALABAMA PULP AND PAPER MILL

2—12′ x 45′ BARKING DRUMS

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INDUSTRIAL CONSTRUCTION DIVISION

BUILDERS OF MODERN PAPER MILLS

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Union Bag & Paper Corporation	**Savannah, Georgia**
Container Corporation of America	**Fernandina, Florida**
National Container Corporation	**Jacksonville, Florida**
Southland Paper Mills, Inc.	**Lufkin, Texas**
Champion Paper & Fibre Company	**Pasadena, Texas**
Bedford Pulp & Paper Company, Inc.	**Big Island, Virginia**
Hudson Pulp & Paper Company	**Palatka, Florida**
B. F. D. Division, Diamond Match Co.	**Ogdensburg and Plattsburg, N. Y.**
Dexter Sulphite Pulp & Paper Company	**Dexter, New York**
Alabama Pulp & Paper Company	**Cantonment, Florida**
St. Joe Paper Company	**Port St. Joe, Florida**

Your Confidence Is Justified *Where This Flag Flies*

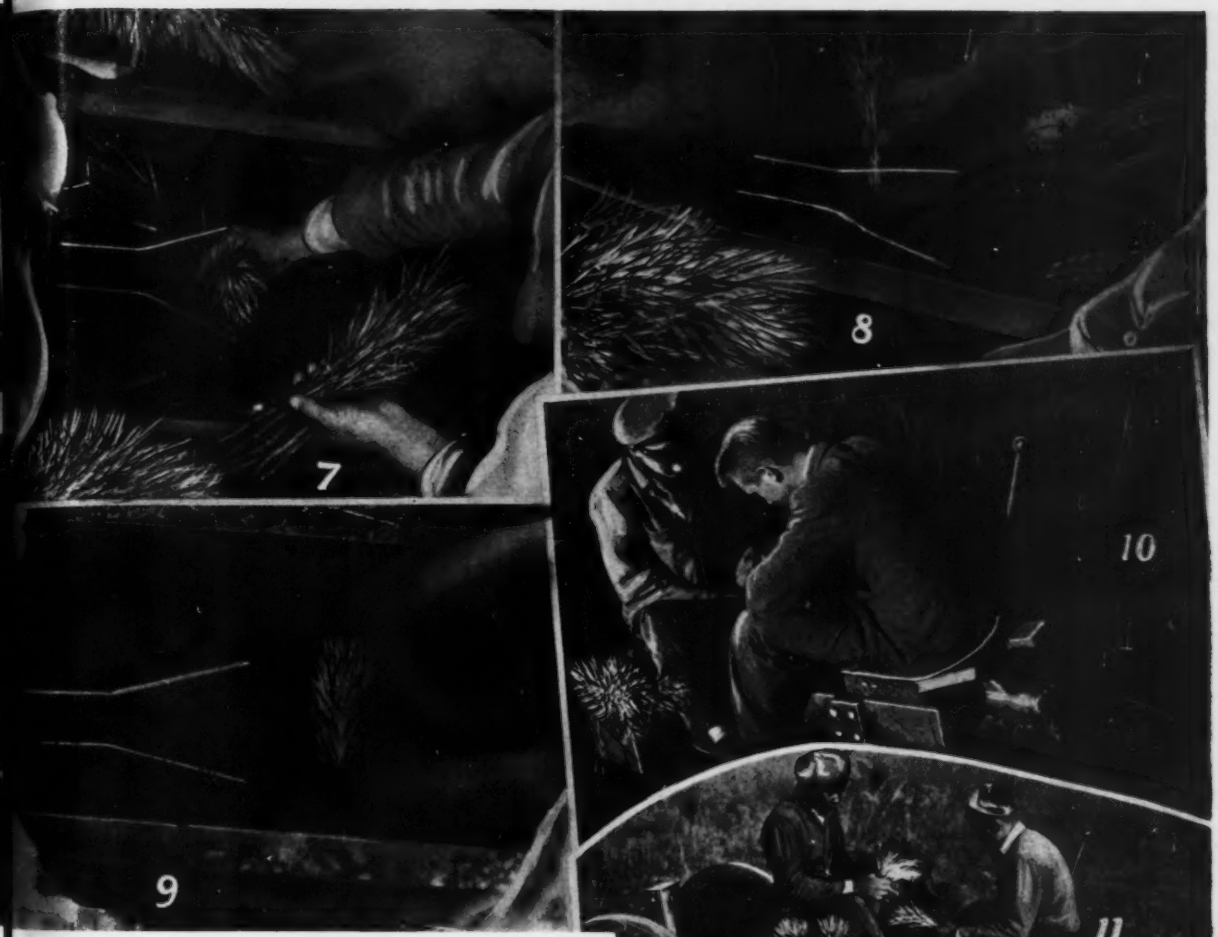
17 BATTERY PLACE, NEW YORK

(1) Seedlings heeled in at planting site. 30,000 trees—enough to plant 30 acres of open land—shown in picture. (2) Loblolly pine seedlings in pails—500 in each pail. (3) Lowther Tree Planting machine. Rolling cowlter blade ahead of planting plow (a) cuts sod and roots (shown lifted in photograph.) Small rubber-tired wheels (b) under seat pack soil after seedling is planted. (4) Another view of planting machine. Handle at right raises or lowers planting plow. Depth adjusted to fit planting conditions. (5) Same machine back to front view. Seedlings in reservoirs ready to be planted. (6) Planting machine with plow in ground. (7) Setting seedlings in planting slots. Note size of seedlings in left hand. (8) Another view of same showing packing wheels under planter's seat. (9) Planted seedling held by closing soil of

Picture Story of First by Gair Woodlands

"This is the first year that we have used a tree planting machine," the Gair Woodlands Corp., stated in a recent issue of *The Gair News*. "With this machine, we started work in South Carolina early in December and planted trees in the Wilmington, Moncks Corner and Allendale areas in that state before proceeding to Georgia where we have completed the Hinesville area and are now working in the Hazlehurst area."

Before the end of February the machine was operating in Florida, where the Corporation completed its planting program for this year. Eight hundred thousand loblolly pine seedlings were ordered from State Nurseries in South Carolina, Georgia and Florida for the season, but because of a short supply of trees Gair was allotted only about 600,000. It is hoped to secure more trees next year and if



slit about to go between planting wheels at rear of machine. (10) Planter and helper. Note planted seedling just behind machine. (11) Similar to above. Helper opens bundle of seedlings and sorts them to straighten roots and speed work. (12) D-2 Caterpillar Tractor powers planting machine. Speed averages 2-3 miles an hour. (13) Gair Woodlands Corp., field in Berkeley County, S. C. Machine planted 15,000 seedlings a day in this field. Hand planting would have required 15 or 20 workers. (14) How these seedlings will look seven years hence. Slash pine plantation seven years old. Gair Woodlands Corp. Ace Deloach Tract, Evans County, Ga., April 1948.

Tree Planting Project

Corporation

necessary a second planting machine will be purchased to speed the planting program.

"With the machine we are averaging approximately 10,000 trees per day of operation," a Gair spokesman said. The planting crew consists of the tractor operator, who is the company tractor man for the area in which the work is being done; two local workmen, usually farmers whom we hire to do the planting; and a helper who keeps the machine supplied with trees and checks the accuracy of planting. The local area manager is in charge of the job as a whole and keeps careful track of it to be sure that it is well done. Naturally, weather conditions affect the operation of this machine and we have been hampered this year by excessive rain which has made the ground very wet, but we are highly pleased with the results we have obtained so far."

GIVE IT A RIDE

A Jeffrey scraper conveyor and belt conveyor handling chips.

Jeffrey Pulpwood Conveyors (above and right)

Re-Chippers
Screenings Grinders
Bark Shredders
Saltcake Crushers

Chain Conveyors
Spiral Conveyors
Belt Conveyors
Bucket Elevators
Feeders

These illustrations are typical of how Jeffrey Equipment serves the Pulp and Paper Industry in the handling of pulpwood, chips, bark, salt cake, etc., through the various stages of preparation. Years of experience in designing and building specialized equipment for handling and processing operations in almost every industry has given Jeffrey engineers the knowledge to do the job efficiently and economically for YOU. More detailed information upon request.

THE JEFFREY MANUFACTURING COMPANY
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ESTABLISHED 1877

Complete Line of Material Handling, Processing and Mining Equipment

Aerial view of the St. Regis "Kraft Center" at North Pensacola, Fla.

The Kraft Center

By E. P. McGinn, Industrial Editor

In the Spring of this year the St. Regis Paper Co. began operating the newest and largest unit in its chain of pulp, paper and converting plants.

The "Kraft Center" at North Pensacola, Fla., now includes the new Alabama Pulp & Paper Mill, the new St. Regis Multi-Wall bag plant and the Florida Pulp & Paper Mill which was built in 1940 and acquired by St. Regis in 1946. The Alabama Pulp & Paper Co. and the Florida Pulp & Paper Co. are wholly-owned subsidiaries of St. Regis. The Kraft Center now constitutes the largest integrated operation of wood-to-pulp-to-paper to multi-wall bag operation in existence.

The Alabama Pulp & Paper Mill was designed by R. G. Seip, chief engineer. Hardy S. Ferguson & Co. were the consulting engineers. The bag plant was designed by the engineering department of the St. Regis Multi-Wall bag division. All construction was done by the Merritt, Chapman & Scott Corp.

The water supply is obtained from ten deep well pumps located about three miles from the mill. Each well is equipped with a Layne deep well pump to bring the water to the surface where it enters a 24-inch main that carries it to the million-gallon reservoir located in the mill yard just east of the power plant.

The twin mills are served by two railroads: the Frisco Lines and the Louisville & Nashville. The mill is well supplied with trackage, having two sidings through the woodyard and three tracks running on the northeast side of the pulp and paper mills between these mills and the recovery and power plants. There is another siding on the southwest side of the bag plant and paper mill running between them and the Florida Pulp & Paper Co. mill.

Wood Handling

A woodyard with storage capacity of more than 30,000 cords of pulpwood, is also used to store wood for the Florida Pulp & Paper Co. mill. Since all of the wood handling equipment is arranged in two parallel lines, it is possible with this system to run two kinds of wood simultaneously. The pulpwood is brought in five-foot lengths by truck and rail and is weighed before being unloaded. Jeffrey chain conveyors then carry the wood from storage to the two barking drums. These drums, which were built by Fibre Making Process Co., are 12 feet in diameter by 45 feet long and are suspended by chains. Each drum is driven through a belt and pulley drive by a 720 r.p.m., 150 h.p. motor.

The bark that is removed from the wood falls from the bottom of each drum to a belt conveyor where it is carried to the bark bins or refuse boiler.

The debarked wood travels up inclined conveyors to the two 88-inch chippers which were built by D. J. Murray Mfg. Co., and are of the latest design, each having ten knives and being driven by a 200 h.p., 720 r.p.m. motor. Each has an average capacity of 16 to 18 cords per hour. Bucket elevators carry the chips up to the four

James R. Allen (left) president of the Alabama Pulp & Paper Co., and R. K. Ferguson (right) president of the St. Regis Paper Co., standing in front of the first roll of paper produced on the new paper machine.

The two barking drums in foreground. Conveyors and stacked pulpwood in background.

Link-Belt vibrating chip screens which are located on platforms slightly above the chippers. The oversize chips and slivers are carried to the Waterville chip breakers from whence the reduced chips are returned by bucket conveyors to the screens. Sawdust and fines drop to belt conveyors on which they are carried to the bark bins or refuse boiler.

The accepted chips travel on belt conveyors to the bucket elevators that carry them to the storage bins located above the digesters. Here the chips are transferred to horizontal belts from which they are forced off at any selected place by movable baffles.

Pulp Mill

The total chip bin capacity of 70,000 cubic feet will hold enough chips to make about 250 tons of pulp or slightly more than 24 hours' operation.

Each of the five digesters is equipped with its own swinging chip hopper to facilitate the flow of chips from the bins as needed. The digesters are nine feet in diameter by 40 feet high, with cone shaped bottoms. The volume of each is 2,700 cubic feet and the yield of pulp is about 7¾ tons per cook. The chips are cooked with direct steam at 150 PSI with a cooking cycle of 3½ to 4 hours.

The blow tank is cylindrical with a cone shaped bottom. It is 24 feet in diameter with the vertical walls 25 feet high and the cone part 18¾ feet high. The blow tank will hold approximately two digester blows. It is equipped with a Foster-Wheeler surface condenser to recover the waste heat from the digester blows. The recovered heat is used to heat water for pulp washing. The blow tank cone is equipped with a vertical shaft agitator having six spirally arranged blades; three with 42 inch sweep and three with 30 inch sweep.

From the blow tank the pulp is pumped to a 3-stage washing system, consisting of three Impco vacuum washers, each with cylinders eight feet in diameter with 12 foot face. The washers are preceded by Impco vibrating type knotter screens and a Dezurik consistency regulator to provide more uniform and efficient washing. The knotter rejects are discarded and not returned to the system.

The washer cylinders are driven by variable speed D.C. motors. The black liquor drops from each washer through a vacuum leg to a tank 30 feet in diameter by 20 feet high. The black liquor is pumped from these tanks to a foam tank 20 feet in diameter and 35 feet high, equipped with a mechanical foam breaker. From here the liquor goes to the evaporator feed storage tank.

The washed stock drops to a concrete storage chest equipped with a Shartle propeller type agitator. Here it is diluted to about one-half of one percent consistency with white water from the vacuum thickeners before passing to the flat screens. There are eight rows of these screens, six primary screens and two tailing screens. The screens were built by the Improved Paper Machinery Co., and the screen plates were supplied by the Magnus Metal Co.

The rejects from the primary screens pass to the tailing screens. The rejects from the tailing screens are discarded and the accepted stock returned to the washed stock chest for rescreening.

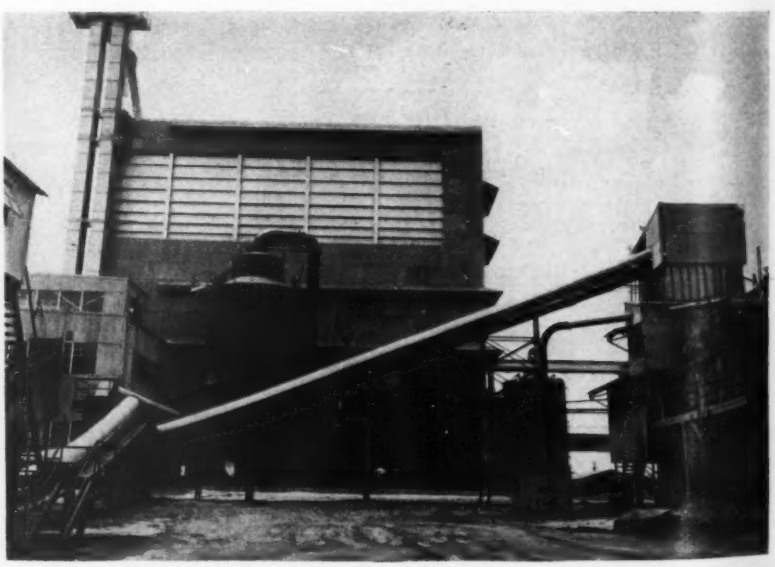
The accepted stock from the primary screens is pumped to the two Impco vacuum thickeners arranged in parallel. The cylinders of these units are eight feet in diameter with eight-inch face and each is driven by a D.C. variable speed motor. The effluent from these thickeners is pumped by a Goulds 11,000 G.P.M. pump back to the washed stock chest to be used for dilution. The thickened stock drops to a storage chest similar to the washed stock chest.

Paper Mill

The stock from the screened pulp storage chest is pumped to the Jordans. There are 12 of these Shartle Miami Jordans piped so that they may be used in any combination of series-parallel arrangement. The jordanned stock drops into a small chest before being diluted to about .3 percent consistency and is then pumped by the 32,000 G.P.M. fan pump to the paper machine head box. This is a gravity flow head box built by the Valley Iron Works.

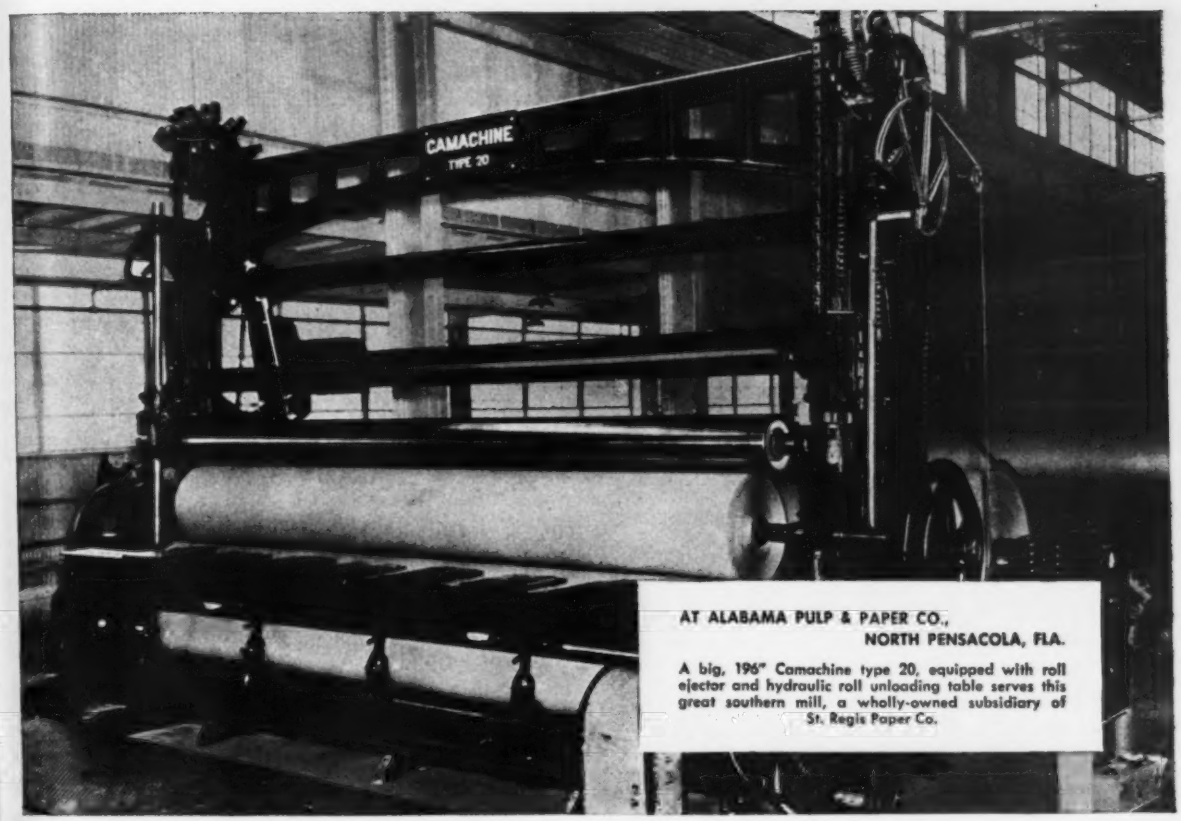
The paper machine was built by the Black-Clawson Co. and is equipped with a Fourdrinier wire 210 inches wide and 110 feet long. The machine is expected to operate at about 1,600 feet per minute but may possibly reach a maximum of 2,000 F.P.M. on lighter-weight papers.

The suction couch roll is 40 inches in diameter with 212 inch face and there are two suction presses each 30 inches in diameter with 210 inch face. The machine is also equipped with a smoothing press ahead of the driers.



Digester house. Chip elevators at left. Blow tank with heat recovery unit in center.

NOW it's easy to unload heavy rolls...



AT ALABAMA PULP & PAPER CO., NORTH PENSACOLA, FLA.

A big, 196" Camachine type 20, equipped with roll ejector and hydraulic roll unloading table serves this great southern mill, a wholly-owned subsidiary of St. Regis Paper Co.

The Camachine Hydraulic Roll Unloading Table, operated by pushbutton control is raised to receive the finished roll from the winder . . . and (below) lowered, stop-and-hold — at any point down to floor level.

The Camachine Hydraulic Roll Unloading Table is only one of many post-war developments which have been made available on famous mill-type Camachines.

Other exclusive Camachine developments which you can't afford to overlook are: the pneumatic-brake on drive and idler roll; push-button controlled, motor-driven riding-roll lift and roll ejector; and pneumatically controlled pressure on the cutter wheels and cutter spacer bar.

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FOR FAST, TOP QUALITY ROLL PRODUCTION

...the world over

AA-182

Two 88-inch, ten-knife Murray chippers.

There are four drier sections containing a total of eight felt driers and 60 paper driers having a diameter of 60 inches and a face of 208 inches.

There are two Farrel - Birmingham calender stocks each having eight rolls with 206-inch faces. The bottom rolls in each stack are 32 inches in diameter.

There is a Pope type reel 42 inches in diameter with a 206 inch face and a Cameron winder and slitter with 207 inch face. The maximum trim for this paper machine is 196 inches.

The paper machine is driven by a Westinghouse sectional all-electric drive. The prime mover is a 2,300 volt synchronous A.C. motor driving a 1,250 K.W., 600-volt D.C. generator.

There are 11 D.C. motors driving the various drier sections, presses, etc. The winder is equipped with its own M.G. set to supply power for the 150 H.P. D.C. motor that drives the winder through a belt.

The paper machine is almost completely equipped with anti - friction bearings and pressure lubrication for these bearings is provided by a Bowser lubrication system that continually filters and cools the oil.

A large Shartle broke beater is located under the dry end of the paper machine. This handles waste from the bag plant as well as machine broke.

Paper from the winder goes to the finishing room which is located at the end of the paper machine between it and the bag plant. After being weighed and stencilled the rolls go directly to the bag plant.

Bag Plant

Paper for the inner walls of Multi-Wall bags is not printed and therefore may be taken to the tubers. Paper to be printed is carried to the printing presses.

Transportation of the rolls between the finishing room and the bag plant is handled by semi-automatic conveyors and elevators provided by the Jeffrey Mfg. Co. Most of the rolls are 42 inches in diameter but the width will vary with the different machines on which it is to be used.

The new plant produces all types of Multi-Wall bags including: sewn valve, sewn open-mouth, pasted valve, pasted open-mouth, five- and 10-pound sugar pockets and the Multi-Wall bags used for containing ten filled 10 - pound sugar pockets or 20 filled five-pound sugar pockets. These containers are also made in other sizes to hold different numbers of the filled sugar pockets.

Multi - Wall bags are now used to package practically all types of powdered or granular material and are being used more and more as shipping containers for groups of filled smaller bags or packages such as the sugar pockets described above.

When the installation of equipment has been completed, which will be sometime this Fall, the bag plant will have seven complete production lines for heavy duty bags in addition to five Potdevin sugar pocket machines and two Weber S.O.S. machines for making the shipping containers for the filled sugar pockets.

The seven production lines include five tubers for sewn bags, two of which are in operation, one is being installed and the other two are nearing completion at the St. Regis machine shop in Oswego, N.Y. All of these tubers may be used for sewn valve or sewn open mouth bags. Each of these lines will be equipped with its own valvers and stitchers.

Printing

One of the most important auxiliary operations in any bag plant is printing. In this plant all of the printing is done in the "web," that is, while still in roll form. Although only two presses are in operation at present, the plans call for a total of five presses to be installed in the pressroom, which is located in the north corner of the ground floor of the bag plant.

One of the presses now in operation prints up to six colors at a rate of 650 feet per minute. Another one of these presses will be installed in the near future. The three other presses are Burroughs presses and were designed and built by the St. Regis engineering division at Oswego, N.Y. These machines print four colors at a web speed of 850 feet per minute.

Because of the comparatively rough surface of kraft bag paper, the best printing results are obtained with rubber plates. Most of these plates are cut by hand but some are made of vulcanized rubber by first setting the form in metal, either with type or photoengraving cuts, then making a matrix in thermosetting plastic and finally using this matrix to mold and vulcanize the rubber plates.

All of the multi - color printing is "wet process" in which the several colors are put on in immediate succession, the tack of each succeeding ink being less than that of its predecessor. As the printing is completed the paper is immediately rewound and the rolls sent to the bag machines by elevators and conveyors.

Sewn Bags

The sewn bag tubers operate at a rate of 250 tubes per minute. Most of the tubes have four or five plies but the machines are capable of producing tubes containing from one to six walls.

Top floor of digester house showing swinging hoppers for feeding chips into the digesters.

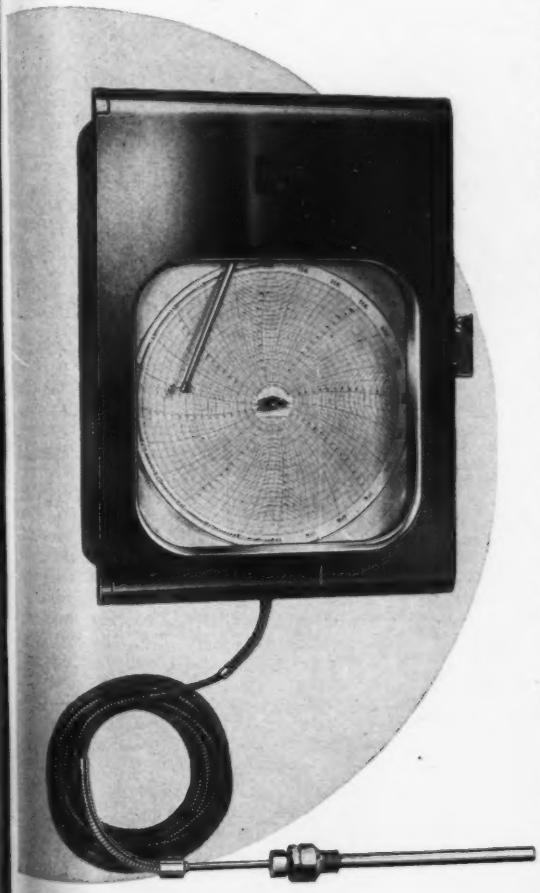
Bristol Presents

New developments in

· RECORDING THERMOMETERS

Entirely new design throughout

Far-Reaching Improvements in Dependable Accuracy and Durability



Bristol's new Series 500 recording thermometers — designed to give you everything you've ever wanted in recording thermometers

Bristol, originator of the pressure type or bulb-and-tubing type recording thermometer, now brings you the new Series 500 instruments in various temperature ranges from -125°F. to 1000°F.—incorporating every conceivable improvement to make them:

- **SUPREMELY ACCURATE**
- **COMPLETELY DEPENDABLE**
- **EASY TO USE**
- **CONVENIENT TO SERVICE**

7 MAJOR IMPROVEMENTS

Measuring System . . . more securely sealed against leaks than ever before. All parts joined with silver solder using induction heating.

Flexible Armor on connecting tubing . . . interlocked design permits flexibility with maximum strength . . . stands much more abuse than any armor hitherto used.

Convertible Bulb . . . easily converted from plain to union or socket types. Perfectly sealed by induction-heated sealed joints.

Linkage . . . flat, strong, adjustable links with polished, stainless steel pins provide sturdy, friction-free connection between measuring element and pen arm mechanism. Easily removed without tools. Measuring-element link arm is adjustable (micrometer type).

Pen Arm Mounting . . . pivoted in stainless steel journals. Shaft supported in rigid, one-piece mounting. Ground and polished stainless steel journals are anti-friction, corrosion-resistant. Backlash and lost motion are eliminated.

Universal Connection . . . mounting block for external tube connection is readily changed from back to bottom without special tools. Measuring element is easily removed or replaced.

Convertible Case Design . . . offers maximum protection to working parts. Is moisture-, fume- and dustproof. Styled for modern beauty to harmonize with other modern instruments and machines. Can be wall, panel or flush mounted, easily convertible.

All Bristol instruments are carefully checked by the most modern quality control methods. Checks at various stages of production and complete testing of the finished instrument insure highest quality and top performance.

Send for Bulletin T835. THE BRISTOL COMPANY, 148 Bristol Road, Waterbury 91, Connecticut. (The Bristol Co. of Canada, Ltd., Toronto, Ontario. Bristol's Instrument Co., Ltd., London N.W. 10, England.)

IMMEDIATE DELIVERY! Bristol has hundreds of recording and controlling instruments as well as pyrometers and thermocouples *in stock* for immediate delivery. Send for Bulletin W1811, Stock Instruments, and Bulletin P1235, Thermocouples and Pyrometer Accessories.

BRISTOL

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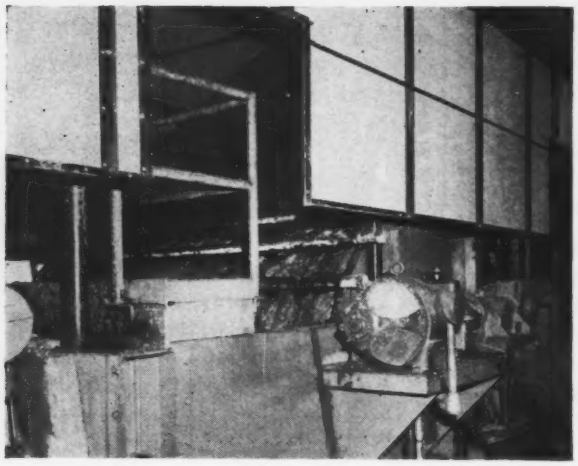
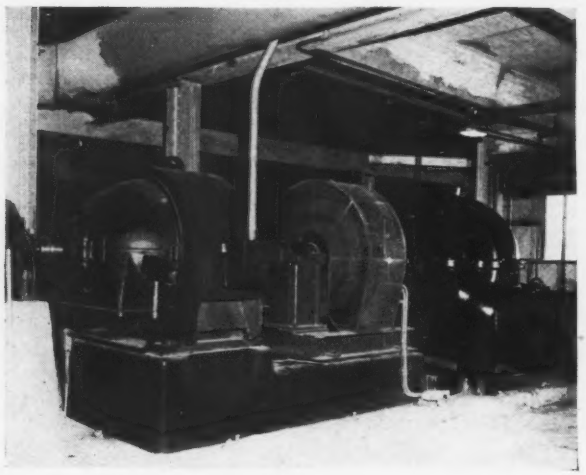
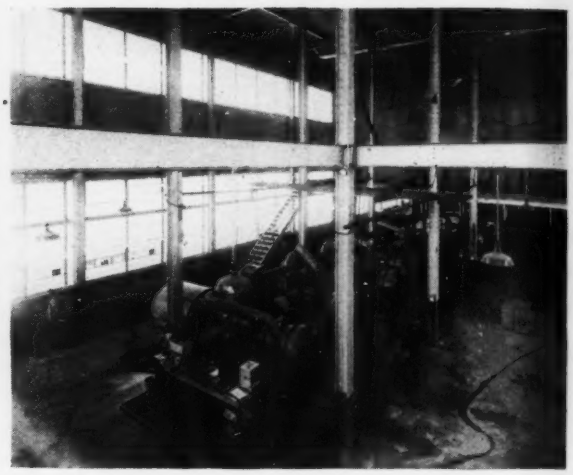
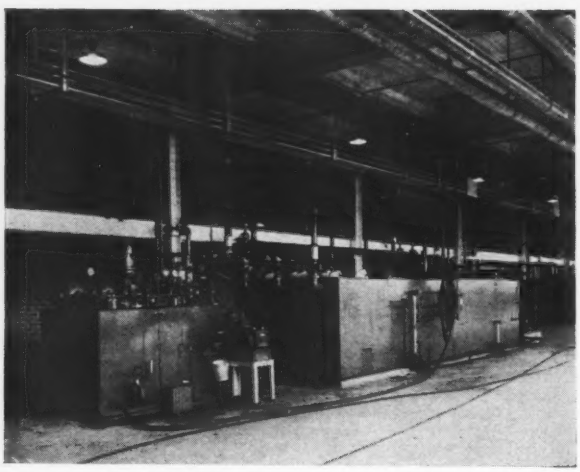
AUTOMATIC CONTROLLING AND RECORDING INSTRUMENTS









TOP, LEFT: Part of the Improved Paper Machinery Co., three-stage washing system. TOP, RIGHT: Two of the eight lines of flat screens. CENTER, LEFT: The 32,000 G. P.M. fan pumps with splashproof Westinghouse motor. CENTER, RIGHT: Six of the 12 Shartle Miami No. 5 Jordans. LEFT: The Bowser lubricating system filters and cools the oil for the paper anti - friction bearings.

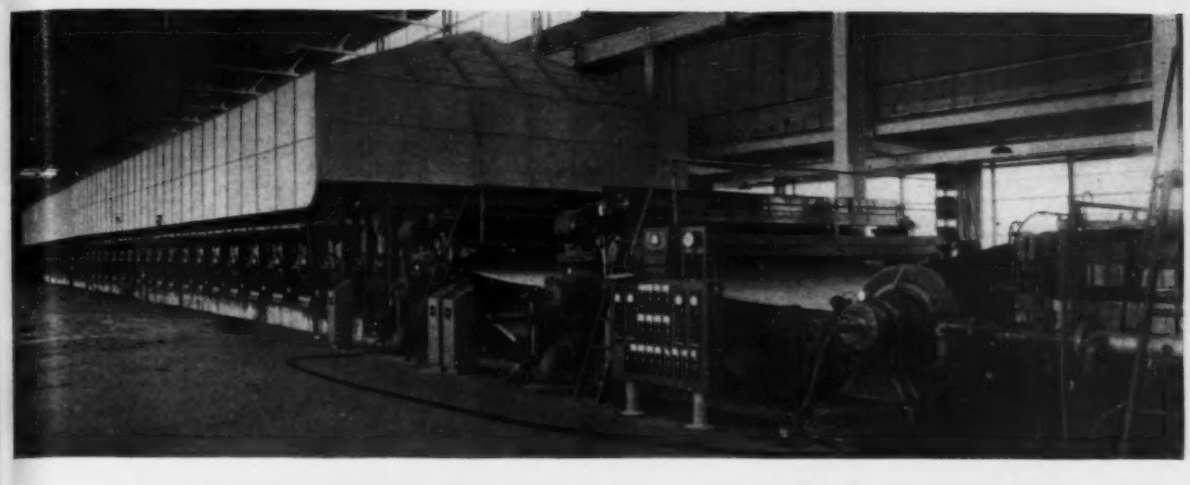
Since each ply is made from a separate roll of paper they may be all alike or each made from a different kind of paper.

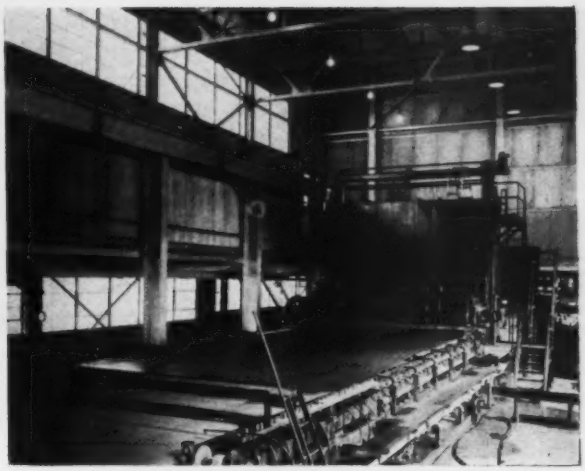
In placing the rolls of paper on the unwinding reels of the tuber each roll is offset from the next by about two inches. This allows an exposed edge on each sheet where the adhesive is applied. As these edges are folded and brought together to form a flattened tube, the edge of each sheet containing the adhesive is pressed against the opposite edge of the same sheet with the adhesive in between. The offset edges of the various sheets cause the seams in the tubes to be staggered and thus produce greater strength and less bulk than if the seams were all in line.

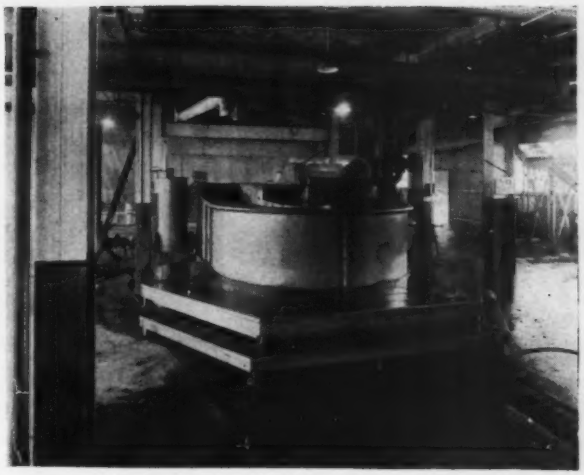
As the tube is formed and flattened, a V-fold is put in each side. When the completed bag is filled, these folds open up to form the two narrower sides. The tube passes through press rolls to flatten the seams and help seal the adhesive. A rotary knife then cuts the tube in sections of the correct length causing them to fall on a conveyor which carries them to another machine which notches and folds the valve in the proper corner. These valving machines are "Taggart Design" and can be adjusted to form valves from 2¾ to 6½ inches deep.

For the benefit of those unfamiliar with valve type bags it may be stated that these containers are completely sealed except for the small opening in one of the top corners, which allows a feeding tube to be inserted. The bag is completely filled through this tube. In fact, a slight internal pressure is produced so that as the feed tube is withdrawn the opening automatically closes.

Bags used for certain types of materials require a more complete closure than is provided by the regular valve.







TOP: Press and dryer section of the Black-Clawson paper machine, showing suction couch, two suction presses and smoothing press. CENTER, LEFT: Dry end of paper machine, showing Cameron rewinder. CENTER, RIGHT: The 210-inch Black-Clawson Fourdrinier and Valley headbox RIGHT: The only beater in the mill is a Shartle 64-inch by 48-inch broke beater.

A special sleeve or valve extension is inserted in each of these bags. Until recently it was necessary to insert these sleeves by hand but a machine recently designed and built by the St. Regis engineering division at Oswego, N.Y., inserts the sleeves automatically.

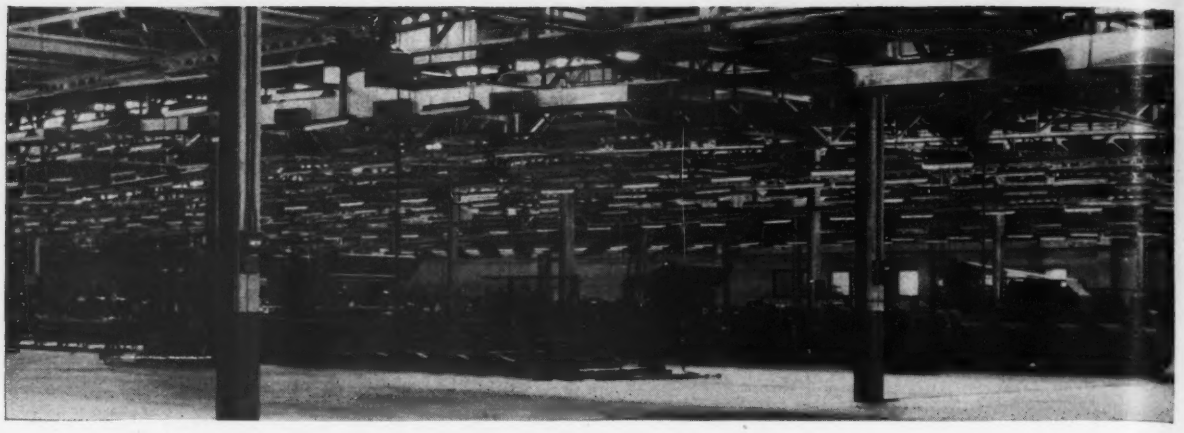
The next step in the process is closing the ends. With this type of bag the ends are closed by folding paper tape over the ends and sewing the seam with heavy twine. The sewing machines used here are of the most modern design that sews both ends simultaneously. From this machine the bags pass down a conveyor where they are inspected and then go to an inclined conveyor which carries them to the floor below. Bundling machines compress packs of 100 bags which are then tied and sent to storage to await shipment.

The manufacture of sewn open-mouth bags is quite similar to that of the valve bags up to the point where the valve is put in. The bottom end of the open mouth bag is sewn like that of the valve bags. A longer tube is used and the top is left open to be tied after filling.

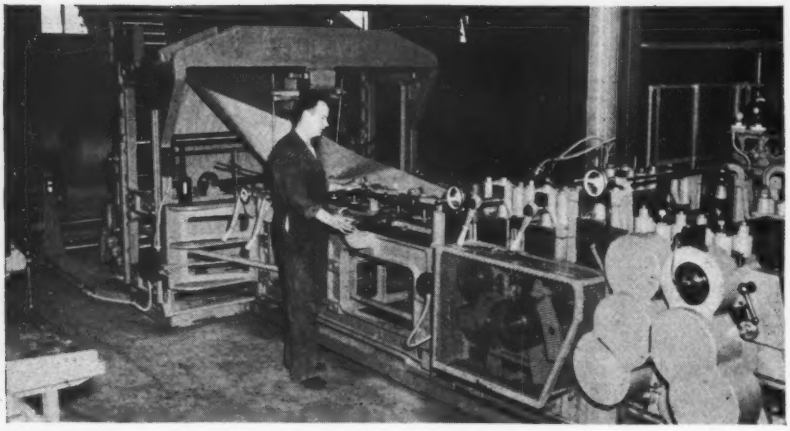
Two complete lines for pasted bags are installed at the Pensacola plant. The two tubers for these lines are somewhat different, one having been imported from Italy whereas the other was manufactured in Watertown, N.Y.

Pasted Bags

The manufacture of the tubes for pasted bags is somewhat similar to that of tubes for sewn bags, the principal difference being at the cut-off. The bottomers for both machines were made by the St. Regis engineering division. There are two types of these machines, the single-end bottomer and the double-end bottomer. The single-end machine is somewhat simpler than the other, its only function being to



General view of main floor of bag plant.



Farming tubes for sewn bags.

form the bottoms for open mouth bags.

The double-end bottomer forms the valve in the top and then forms and pastes both ends of the tube. The finished bags run through a series of squeeze rolls that help to set the adhesive.

Sugar Pockets

Double-walled sugar pockets are made in 2-, 5- and 10-pound sizes on automatic machines that perform the entire manufacturing operation at the rate of 350 bags per minute. These bags are all of the open mouthed type which are not sealed until after they are filled. The machines of this type in operation at Pensacola were built by the Potdevin Machine Co., Brooklyn, N.Y.

When all five of these machines attain full production they are expected to produce over one million pockets per day.

Shipping Container Bags

There are two Weber S.O.S. type multi-wall bag machines which are used to make the shipping containers for filled sugar pockets. The two machines are slightly different as shown by the following table of possible bag sizes:

#10AR Machine

	Min.	Max.
Width	10"	17"
Tube Length	20"	42"
Bottom or Tuck	5"	12"

#11AR Machine

	Min.	Max.
Width	10"	19"
Tube Length	24"	64"
Bottom or Tuck	6"	15"

These machines will make bags having one to four plies, with the maximum aggregate basis weight being 240 pounds 24 x 36 x 480. Photo-cell localizing devices automatically synchronize the pre-printed outer wall with the cut-off.

The S.O.S. type bag produced by these machines has the bottom formation on the opposite side from the seam. This construction makes the bag more sift-proof and at the same time eliminates the "knee" which is formed when the bottom fold crosses the seam. These machines were supplied by H. C. Weber & Co., Kiel, Wis.

All of the bags move by conveyor to the bundling machines where they are compressed in packs and tied, or in the case of bags to be used for food, the bundles are enclosed in kraft paper before being tied.

Adhesives

One of the essential services required in almost any paper converting plant is the preparation of adhesives. This bag plant has its own department which cooks and prepares the various types of adhesives. Almost all types of raw materials are used in the preparation of these adhesives, including

Making valves in tubes for sewn bags.

HUBBARD

REINFORCED ALUMINUM CORES

Light Weight

LOW FREIGHT

Now Hubbard brings you paper cores of special Reynolds alloy aluminum—the airplane light, battle tough metal. Think of what you'll save on freight alone—with a Hubbard aluminum core weighing only 35 lbs. as against 85 for an iron core for a similar sized paper roll!

The light weight means easier handling, too. Only one man needed for the empty cores.

And aluminum has other advantages that pay off. The tubes, reinforced with steel end inserts are dimensionally stable. No warping or twisting. Paper feeds out true all the way to the end . . . and paper *can* be used right down to the core. No danger of tubes cracking or collapsing in shipment—they're tough.

Hubbard Aluminum Cores are now available in 4", 5", and 6⅝" O.D. sizes. For full particulars, contact

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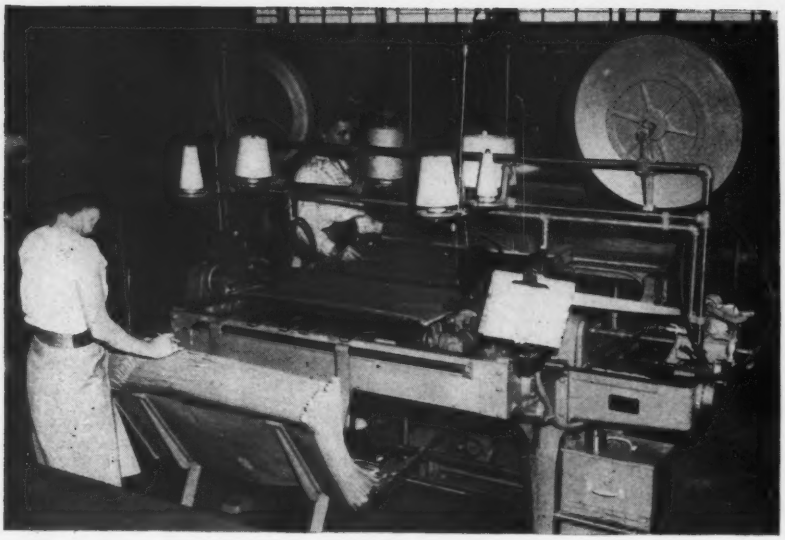
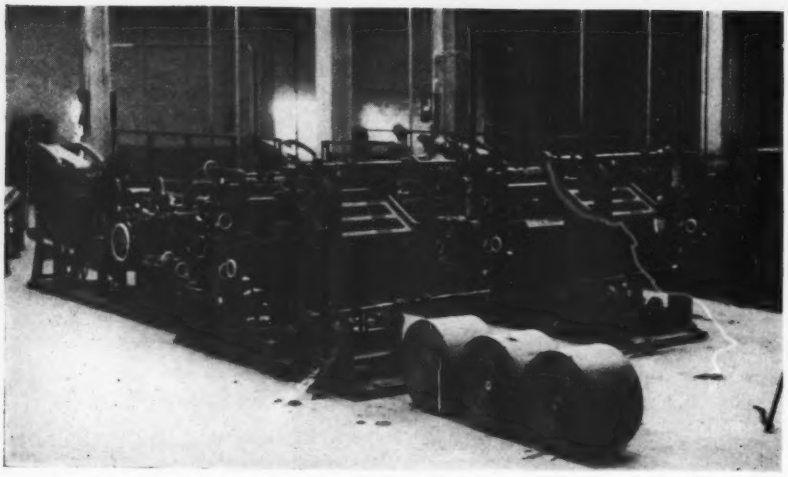
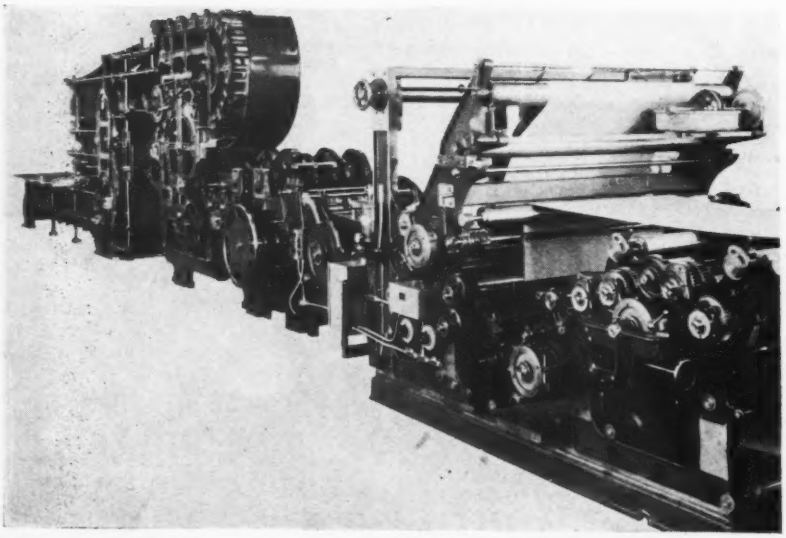


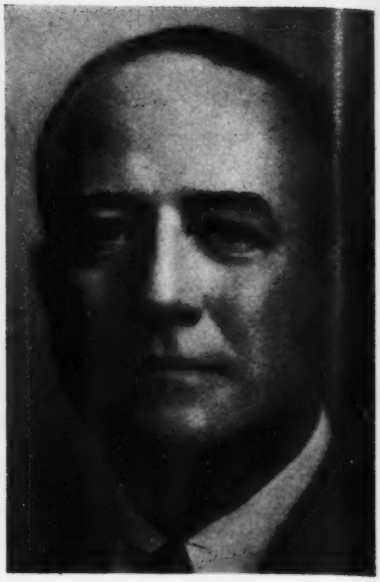
Double stitcher for sewn and valve bags.



Battery of Potdevin sugar pocket machines.



Weber 10-AR S.O.S. bag machine used for making shipping containers.



E. R. GAY
Vice-President and Director
St. Regis Paper Co.
(Directs Packaging Division)

various types of starches and dextrines, animal glue, resin emulsions and latices. This entire operation is under the control of the chemical laboratory.

Seam Dipping

The plant is equipped with a machine for impregnating the sewn ends of bags with a special blend of amorphous waxes. These bags were used to a great extent during the war for overseas shipments and are finding considerable use now for packing hygroscopic chemicals such as calcium chloride.

Bag Plant Service Facilities

The bag plant has its own machine shop provided with the necessary personnel and equipment to repair and maintain its specialized machinery. It also has its own storeroom for spare parts as well as a storage room for adhesive raw materials.

Completely equipped women's and men's locker rooms occupy the southwest side of the second floor. Along the northeast wall on this floor are located the offices of the executives and administrative personnel.

General Service Facilities

The general engineering, repair and maintenance departments and general mill stores are located in separate buildings northeast of the power plant along the railroad siding. Complete facilities for electrical and mechanical maintenance and repair are provided.

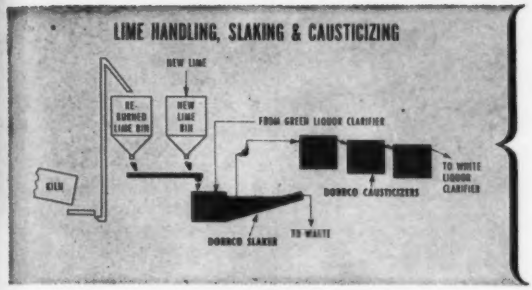
Shower and locker rooms for the various departments of the pulp and paper mills are located at convenient points throughout the mill.

Here's WHY the

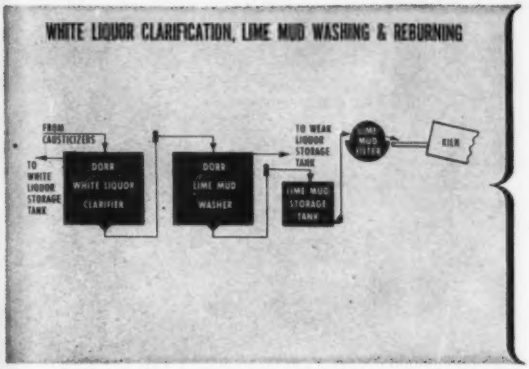
DORR CONTINUOUS RECAUSTICIZING SYSTEM

pays off in RESULTS

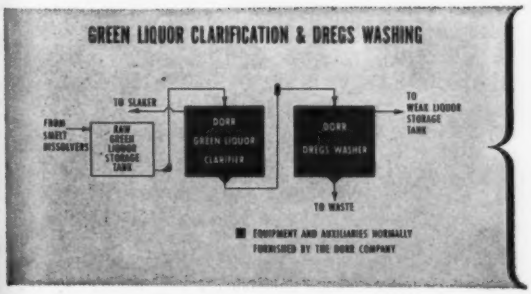
Sound equipment design coupled with improved methods of recausticizing is the reason why *the Dorr Continuous Recausticizing System provides trouble-free operation at top efficiency . . . with minimum operating costs.*



A grit-free milk of lime at correct dilution for causticizing is produced by the DORRCO SLAKER . . . a compact two-in-one unit of stainless steel construction with low first and operating costs. Adequate detention time to complete the causticizing reaction is provided by the DORRCO CAUSTICIZERS . . . of stainless steel construction requiring practically no maintenance.


WHITE LIQUOR CLARIFICATION, LIME MUD WASHING & REBURNING
FROM CAUSTICIZERS
TO WHITE LIQUOR STORAGE TANK
DORR WHITE LIQUOR CLARIFIER
DORR LIME MUD WASHER
TO WEAK LIQUOR STORAGE TANK
LIME MUD STORAGE TANK
LIME MUD FILTER
KILN

Uniformly strong and clear white liquor is produced by the DORR WHITE LIQUOR CLARIFIER . . . making it easier to control and operate the digester and resulting in more uniform pulp production. The lime mud is given *two* stages of decantation washing by the DORR LIME MUD WASHER . . . thus improving kiln and filter operation and increasing soda recovery. The lime and storage tank provides uniform feed to the Oliver Vacuum Filter which produces a well dewatered cake for burning.


GREEN LIQUOR CLARIFICATION & DREGS WASHING
TO SLAKER
FROM SMELT DISSOLVERS
RAW GREEN LIQUOR STORAGE TANK
DORR GREEN LIQUOR CLARIFIER
DORR DREGS WASHER
TO WEAK LIQUOR STORAGE TANK
TO WASTE
EQUIPMENT AND ACCESSORIES NORMALLY FURNISHED BY THE DORR COMPANY

A clean green liquor, essentially free of inorganics, is produced by the DORR GREEN LIQUOR CLARIFIER . . . permitting the lime mud to be reburned without an accumulation of impurities. Green liquor dregs are given *four* stages of washing in the DORR DREGS WASHER before discarding . . . thereby reducing the soda lost in the dregs to an absolute minimum.

A Dorr recausticizing specialist will gladly explain in further detail exactly how these methods pay off on overall pulp mill production.

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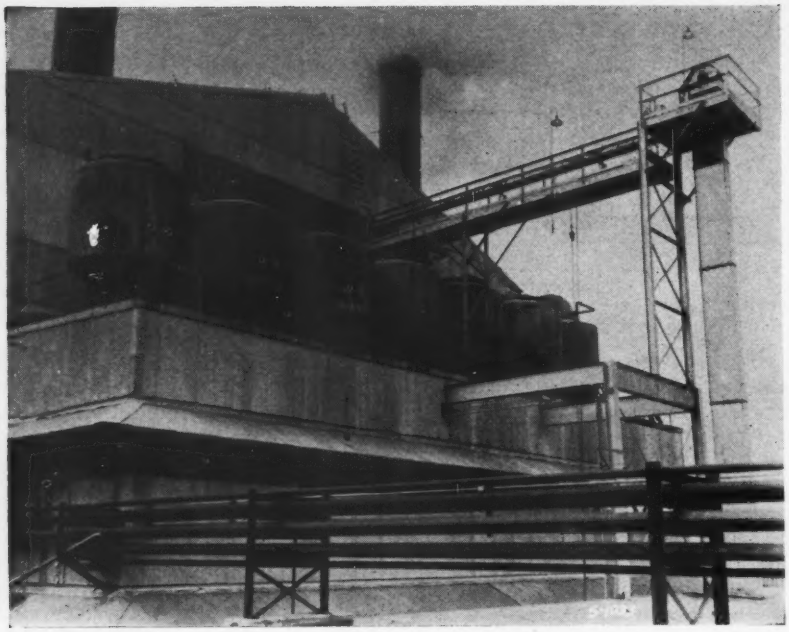
DORR

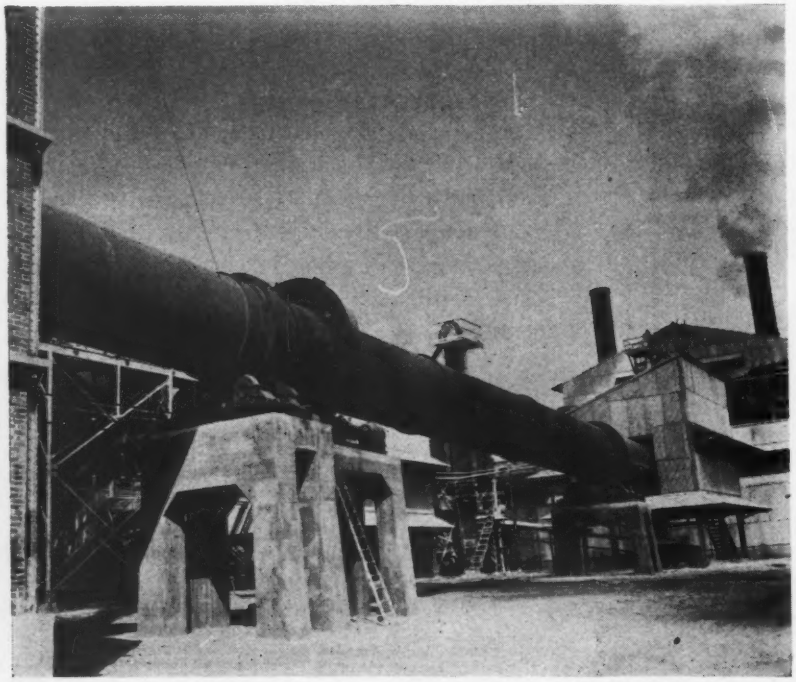
RESEARCH ENGINEERING EQUIPMENT



Swenson six-body sextuple effect evaporator, showing exposed vapor heads at top.

Chemical Recovery

One of the most important parts of a modern kraft pulp mill is the recovery system. An efficient recovery system will usually supply sufficient heat for all of the steam and electric power used in the pulp mill. Even with an integrated pulp and paper system the recovery plant usually supplies 30 to 50 percent of the total power requirements. In spite of the valuable power produced, the primary function of a recovery system is still to recover the cooking chemicals for re-use in the process. Another function of the recovery plant that has become increasingly important in recent years is the reduction in stream pollution. Since all waste effluents from pulp and paper mills are usually discharged to a stream, the more efficient the chemical recovery system functions, the less material will be sent to the stream.



Lime kiln in foreground. Dorr causticizing system at left. Recovery building at right, rear.

Evaporators

The black liquor flows from the evaporator feed storage to the Swenson, L.T.V. six-effect evaporator. This evaporator is designed to receive 216,000 lbs. per hour of black liquor at 14 percent solids and 170° F. and deliver 60,500 lbs. per hour of thick black liquor containing 50 percent total solids at 213° F. This equivalent to 155,000 lbs. per hour of evaporation.

Effects No. 1 and No. 2, which handle the concentrated liquor, are equipped with 394 stainless steel tubes two inches O.D. and 26 feet long. Each of the other effects has 423 carbon steel tubes two inches O.D. and 30 feet long. The tube sheets, lower body and top deflector of effects No. 1 and No. 2 are stainless clad.

The weak black liquor is fed to the bottoms of effects No. 5 and No. 6 where it passes up through the tubes which are heated by the vapors from effects No. 4 and No. 5, respectively. The vapor from No. 6 passes to a condenser. The partially concentrated liquor from effects No. 5 and No. 6 are combined and fed to the bottom of No. 4 effect. Steam at 50 PSI is admitted to No. 1 effect and controlled by Foxboro instruments.

Effect No. 1 is arranged so that the concentrated liquor discharged from this stage may be passed through the body again.

The flow of liquor to effect No. 6 is controlled by Foxboro instruments.

The steam condensate from No. 1 effect goes back to the boiler feed water tank. The condensate from the other effects passes through condensate flash tanks, of which there are four, one each for effects No's. 2, 3, 4 and 5.

The pumps used to transfer the liquor between stages were made by the La Bour Pump Co., Elkhart, Ind. All other pumps for handling the liquor were supplied by the Goulds Pump Co., Seneca Falls, N. Y. The salt cake make-up is added to the black liquor by means of Jeffrey vibratory feeders.

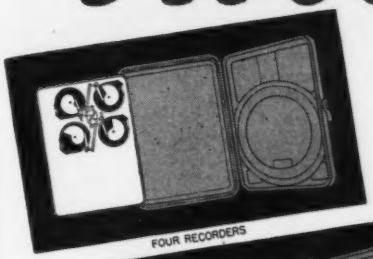
Cyclone Evaporator

The liquor containing about 50 percent total solids as discharged from the Swenson evaporators is further concentrated to 55-60 percent solids by passing through a direct contact cyclone evaporator and scrubber which reclaims some of the waste heat from the recovery furnace combustion gases before they are discharged to the stack. This unit also helps to reduce fly ash and odors and recovers a portion of the chemicals that would be blown up the stack.

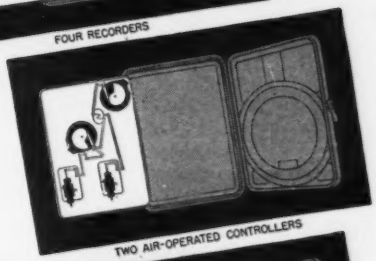
Recovery Furnaces

The recovery furnaces are Babcock & Wilson Tomlinson type and were built by the Babcock & Wilcox Co. Each furnace is designed to burn 12,500 lbs. per hour of black liquor solids and to produce 45,000 lbs. per hour of steam. The furnace walls are water-cooled and the boilers are of the three-

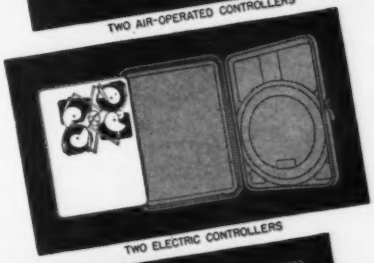
these and 100,000 more



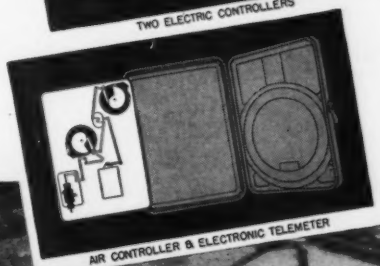
FOUR RECORDERS



TWO AIR-OPERATED CONTROLLERS



TWO ELECTRIC CONTROLLERS



AIR CONTROLLER & ELECTRONIC TELEMETER

FROM 4 CIRCUITS AND 8 BASIC PARTS

What's your control problem? Flow—temperature—level? Are you using solids—liquids—gases?

No matter what you process, four basic circuits and eight basic component parts will give you more than 100,000 different electronic measuring and controlling combinations. That's how Bailey has simplified controls for processing industries.

The four arrangements illustrated show how easily Bailey interchangeable parts can be used. It's no longer necessary to carry a huge stock of replacement parts for emergency control installations. When you standardize on Bailey controls you are always ready to meet changing conditions within your plant.

And with Bailey simplified controls, your maintenance costs will be less. Maintenance men quickly become familiar with Bailey controls and spend less time on maintenance and installation.

To see for yourself how you can profit with Bailey controls, write for a copy of our bulletin No. 17.

BAILEY METER CO.
1056 Ivanhoe Road • Cleveland, Ohio
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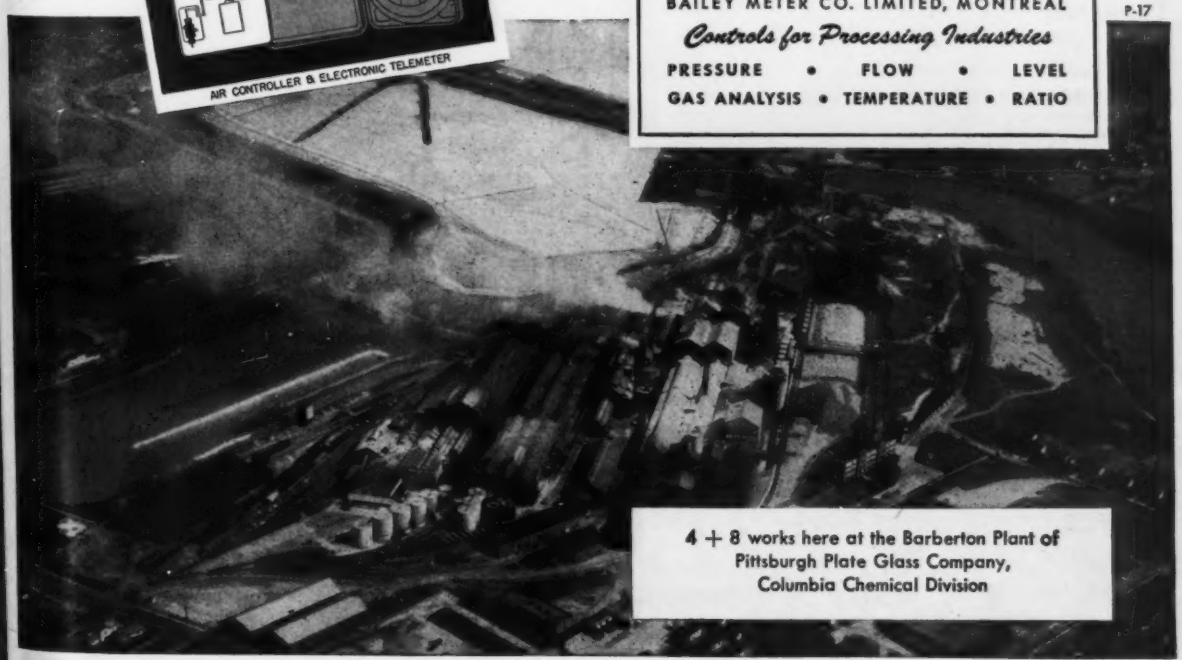
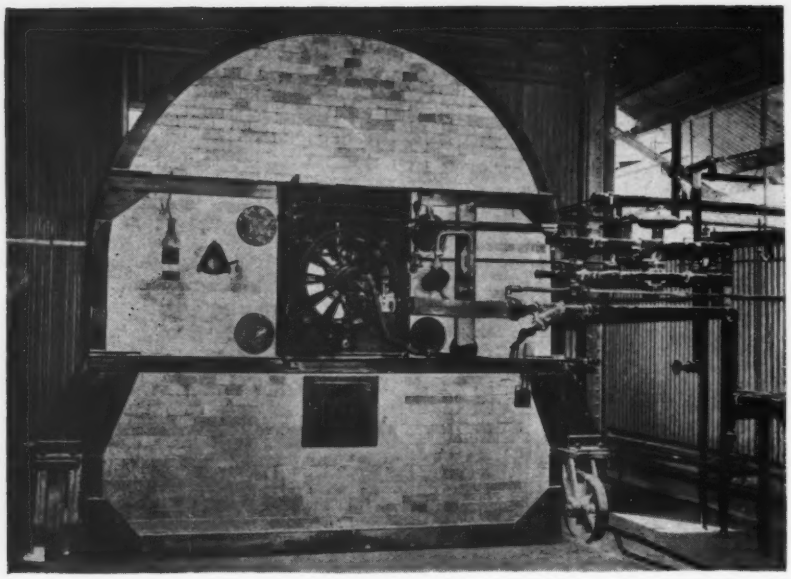
Controls for Processing Industries
PRESSURE • FLOW • LEVEL
GAS ANALYSIS • TEMPERATURE • RATIO

P-17



4 + 8 works here at the Barberton Plant of Pittsburgh Plate Glass Company, Columbia Chemical Division



Burner end of lime kiln.

drum type with two drum economizers.

The steam is generated at about 430 PSI for use at 400 PSI. Each recovery boiler is equipped with a separate superheater.

The smelt from the recovery furnaces drops immediately into the enclosed dissolving tanks, each of which is equipped with a Worthington circulating pump and a turbo-agitator. Goulds pumps are used to transfer the green liquor from the dissolving tanks to the green liquor clarifier. The complete causticizing system (including causticizing tanks, green and white liquor clarifiers, dregs washer and lime mud thickener) was all built by the Dorr Co.

After being clarified, the green liquor goes to the Dorr causticizing tanks and thence to the white liquor clarifier. From here the white liquor is sent to the storage tank and the sludge is sent to the Oliver vacuum lime mud washer. The effluent from this washer is sent to a storage tank from where it is pumped to the dissolving tanks as needed.

The lime mud from the washer drops into a screw conveyor which carries it into the lime kiln. This kiln, which was built by the Vulcan Iron Works, Wilkes-Barre, Pa., is 140 feet long by eight feet in diameter and is equipped with a Harbison-Walker firebrick lining six inches thick. It is constructed of welded steel plates reinforced at points of stress. The two cast steel tires are mounted on the shell by a new rivetless method which has proven to be valuable in overcoming the former tendency of the shell to burn or buckle at these points.

The driving gear consists of a cast steel gear ring and main pinion completely enclosed in a dust-proof oiltight steel casing. The reduction gear is also completely enclosed and is located in a small compartment, underneath the kiln, which also houses the electric driving motor.

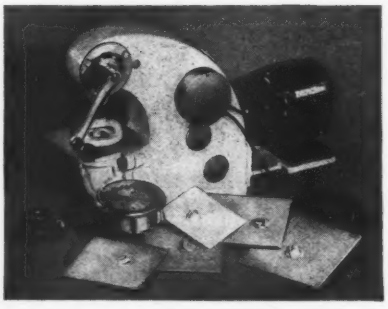
The fuel burner is designed to operate with either natural gas or oil and is regulated by a Bristol optical pyrometer and control system.

Before going to the stack the gases

Burst Test . . .
Weighing . . .
Calipering
Instruments
by Cady

•

Pioneers in Paper Testing Instruments Since 1895

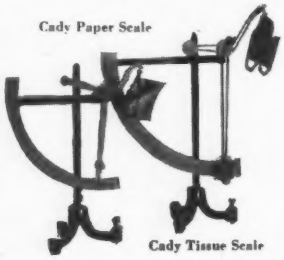


Cady Bursting Strength Tester makes the "Cady" or Mullen or Pop Test on boards and papers. Electric motor actuates hydraulic pressure during Uniform 12 second testing cycle; registers pressure in lbs. per square inch. Tested area always visible; non-slip clamp prevents creeping. Meets CCC Specifications. Various gauges.

Cady Micrometers accurately show thicknesses of papers, boards, other materials. Various models.

Cady Scales register basis weights and sheets counts. Precision calibrated.

Cady Paper Scale



Cady Tissue Scale

Write for Literature and specific information

E. J. CADY & COMPANY

134 N. LaSalle St., Chicago 2, Illinois

SOUTHERN PAPER BOARD CORPORATION

and

ALABAMA PULP & PAPER COMPANY

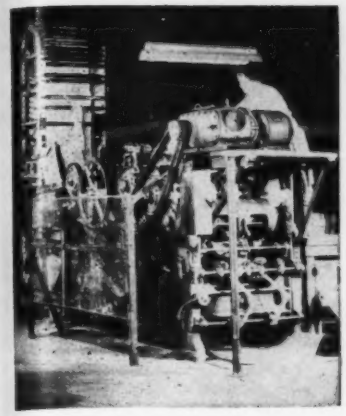
Congratulations

We are proud of the fact that these two outstanding concerns specified DeZurik Easy Operating Plug Valves and DeZurik Consistency Regulators for their new modern plants.

If your plant is not already on our extensive list of users write for data.

DeZURIK SHOWER COMPANY

SARTELL, MINN., U. S. A.



Above: Coty Bottomer, with horizontal type motorized P.I.V. variable speed changer.

Right: St. Regis Tuber, with V-5 vertical type P.I.V. Gear variable speed changer, with extension shaft on hand wheel.

LINK-BELT P.I.V. GEAR SPEED CHANGERS

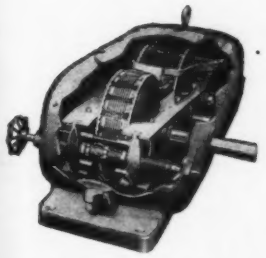
STEP-UP PRODUCTION EFFICIENCY

QUICKER, SIMPLER METHOD OF CHANGING PAPER BAG SIZES—ALSO REDUCES INVESTMENT

Substantial reductions in overhead and time have been effected through the installation of P.I.V. Gear Speed Changers on paper bag making machines at the Wellsburg, W. Va. plant of the Hammond Bag & Paper Company. The length of bag being produced is controlled by the speed of the machine and each ¼" change in bag length was made by changing a pair of fixed-ratio gears.

To permit more rapid change of speed, and to eliminate the investment and upkeep of a large assortment of gears, P.I.V. Gear Speed Changers were installed. Speed changes are made in an instant, without stopping the machine. Furthermore, the "infinitely variable" feature of the P.I.V. gear permits the bag sizes to be varied infinitely instead of by ¼" steps.

With a simple twist of a hand wheel, the ratio between driving and driven shaft speeds is changed by the minutest fraction of a revolution. Once adjusted, this ratio is maintained indefinitely.



The P.I.V. Gear Speed Changer is a unique, all metal, all enclosed device, running in oil, and giving a positive drive with infinitely variable speed ratio between input and output shafts. Speed changes are made instantly and maintained indefinitely. Send for Book 1874-B giving full details and application suggestions.

LINK-BELT COMPANY

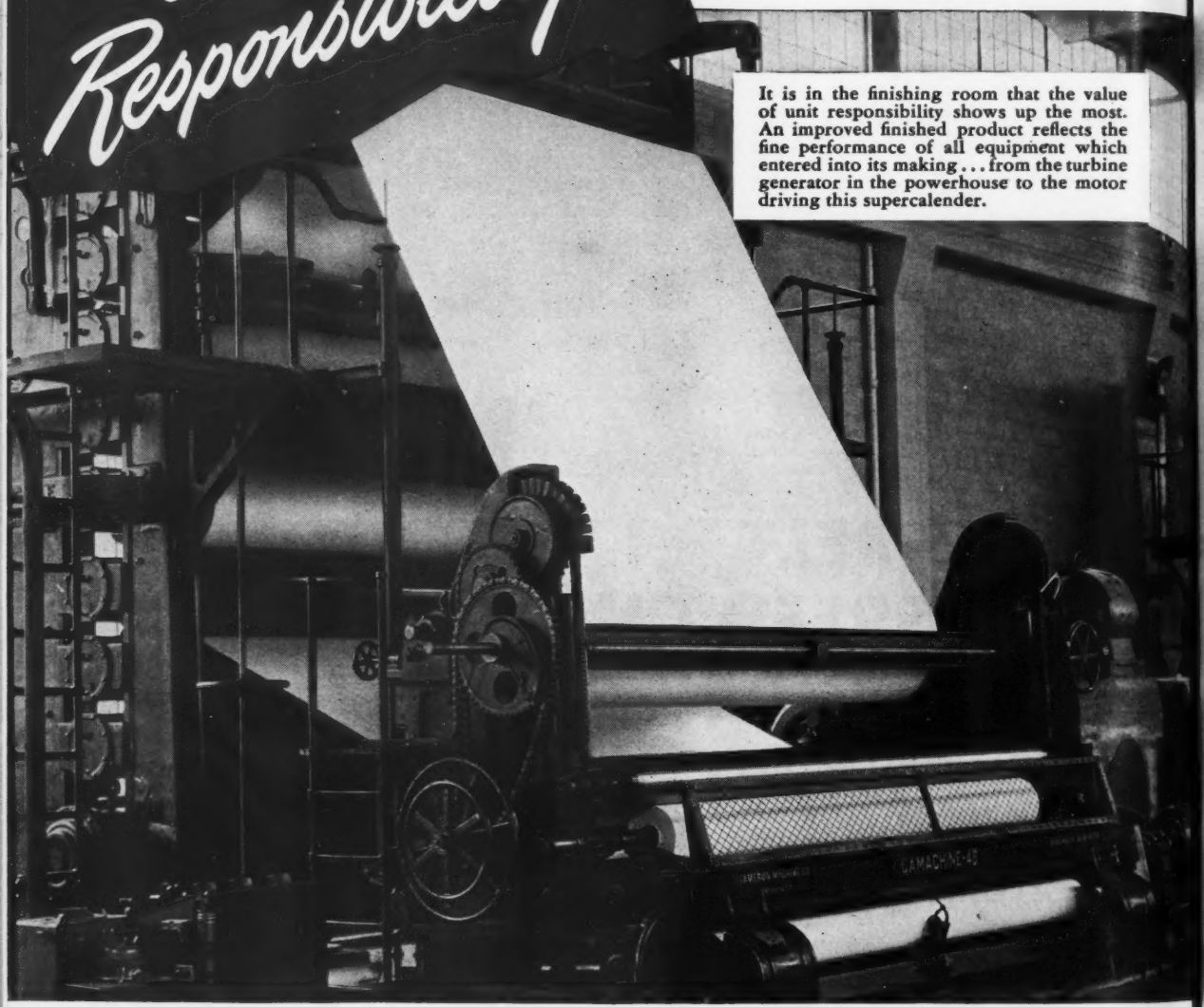
Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices, Factory Branch Stores and Distributors in Principal Cities.

LINK-BELT

Power Transmission Machinery

KEY TO MORE P

Unit Responsibility



It is in the finishing room that the value of unit responsibility shows up the most. An improved finished product reflects the fine performance of all equipment which entered into its making . . . from the turbine generator in the powerhouse to the motor driving this supercalender.

POWER FOR PAPER-MAKING . . .

PRODUCED . . . PROTECTED . . . DELIVERED . . . *DEPENDABLY!*

Steam—and how it is used for heat and power—is a big factor in pulp and paper mill costs and in quality of output.

Westinghouse experience offers important benefits to pulp and paper mill operators in this direction. As a result of more than fifty years of experience in equipping power plants of all types, Westinghouse can carry full responsibility from selection of proper stokers and turbine generators in the powerhouse, to motors and steam auxiliaries in the finishing room.

Westinghouse "know-how" can be counted on both for dependable operation and for proper heat balance between process steam and steam for power.

Process efficiency and product quality start in the powerhouse. Westinghouse Paper Industry Engineers are ready to help you today. For details, call your local Westinghouse office or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94758

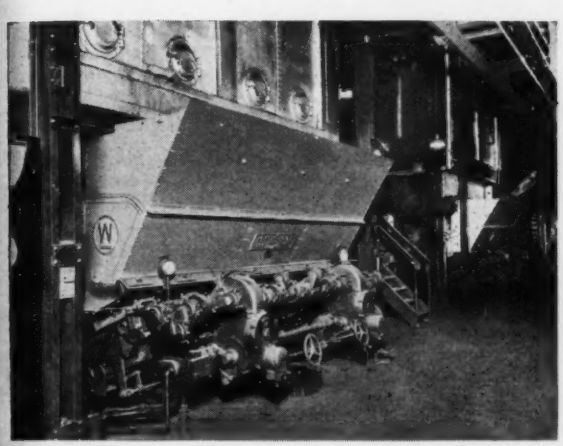
PRODUCTIVE POWER

"WESTINGHOUSE-EQUIPPED THROUGHOUT" MEANS SIMPLIFIED ORDERING, QUICKER INSTALLATION, MORE EFFICIENT OPERATION

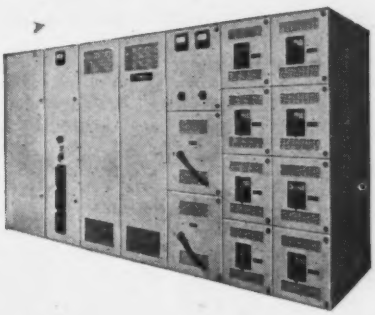
Putting power to work *productively* can be a major problem—or a simple one. When items must be selected, ordered and received from many sources, it means many chances for costly errors and delays . . . divided responsibility—or none at all—for performance of installed equipment.

Westinghouse offers the way to simplify the job. From equipment for generation of electrical or steam power, to the most specialized types of drives and control for its utilization, Westinghouse provides a single source of supply . . . one broad pair of shoulders competent to take responsibility for performance of all parts of the job.

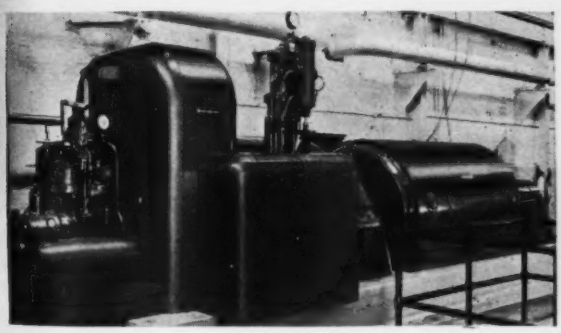
Here are a few of the places where Westinghouse unit responsibility prevents headaches . . . saves money . . . assures *more productive* power:



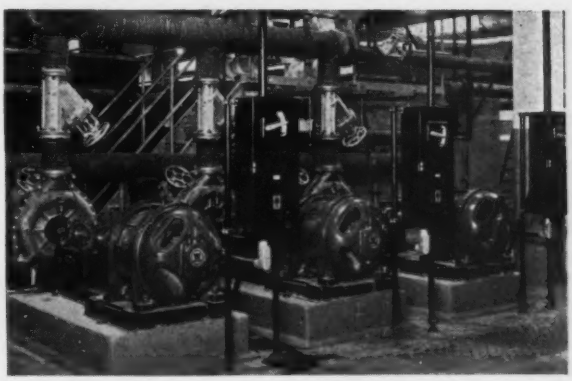
STOKERS—Ability to burn cheaper grades of fuel and to eliminate smoke nuisance are two outstanding advantages of Westinghouse "Link-Grate" Stokers. These stokers fire the boilers supplying power and process steam in a New York paper mill.



SWITCHGEAR—Westinghouse supplies a complete range of "Unitized" metal-clad switchgear that permits quick, economical installation. Unit shown contains a 750-kva, air-cooled transformer, high-voltage, metal-clad air circuit breaker, and draw-out, low-voltage air circuit breakers.



TURBINES—Constant process steam pressure and constant speed are maintained by this modern, 3,000-kw double bleeder turbine in a Wisconsin paper mill. In addition to turbines, Westinghouse supplies condensers in three types and a complete line of auxiliaries including condensate pumps, feed-water heaters, circulating pumps and steam jet air ejectors.

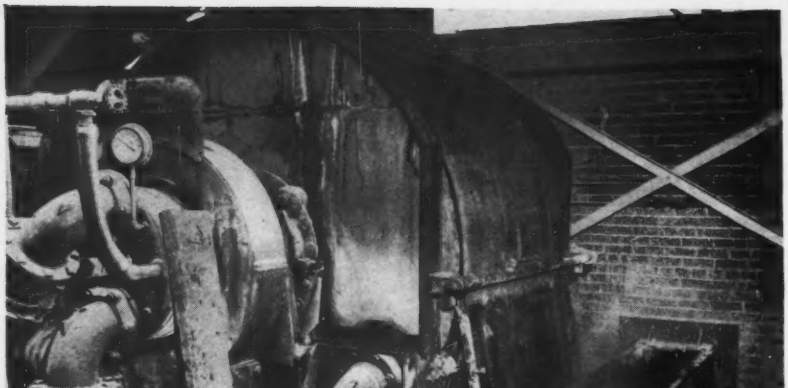


AUXILIARIES—Boiler room auxiliaries driven by Westinghouse motors and control assure continuity of service and give the desired flexibility of operation. Other miscellaneous equipment includes instruments, disconnecting switches, fuses and other electrical products that contribute to more efficient operation.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

MORE PRODUCTIVE POWER FOR INDUSTRY



Oliver lime mud washer at left. At right, Vulcan conveyor taking into kiln.

pass through a scrubber which reduces the fly ash.

The burned lime drops to a storage bin from which it is taken as needed by a conveyor to the slaker. Make-up lime to replace that lost in processing is brought in by rail and carried by a Jeffrey conveyor to a storage bin. Another conveyor carries it to the slaker as needed.

Power Plant

Boilers

The two recovery boilers provide about 90,000 lbs. of steam per hour or approximately one-third of the total requirements. The main power boiler, which is also a Babcock & Wilcox unit, provides 150,000 lbs. of steam per hour and is fired by natural gas. Adjacent to this boiler there are two gas-fired superheaters used to superheat the steam from the recovery boilers.

A fourth Babcock & Wilcox boiler is used to burn bark and refuse. This is a Stirling type boiler equipped with a Hofft stoker. It generates about 30,000 lbs. of steam per hour at 160 PSI to be used for pulp cooking.

Electric Power

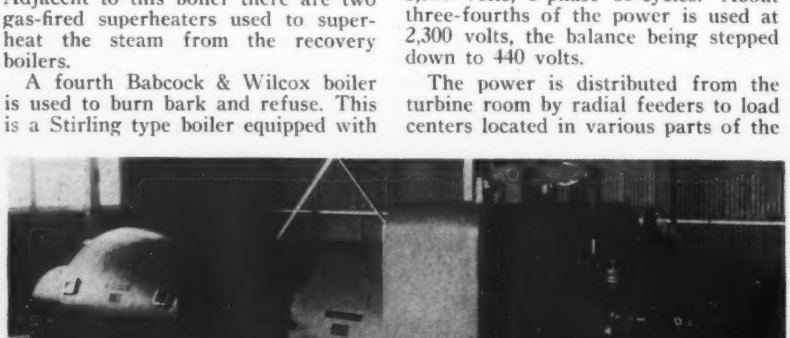
Electric power for the mill is provided by two turbine generators, each designed to produce 6,250 KVA or 5000 KW at 80 percent power factor. Since there is a very good balance between synchronous and induction motors in the mill the power factor is usually very close to unity. Consequently the total capacity of both generators is more than 12,000 KW.

The turbines use steam at 400 PSI 650° F. superheat exhausting through condensers and extracting at 50 PSI for paper mill process steam.

The generators produce current at 2,300 volts, 3-phase 60-cycles. About three-fourths of the power is used at 2,300 volts, the balance being stepped down to 440 volts.

The power is distributed from the turbine room by radial feeders to load centers located in various parts of the mill. The 2,300 volt controls are magnetically operated and are enclosed in self-supporting metal enclosures. The starters have high interrupting capacity fuses. There are about 55 or 60 motors of 250 H.P. or larger which operate on 2,300 volts.

The load centers are equipped with transformers to supply 440-volt current for the more than 200 small motors with capacities ranging from one-half to 250 H.P. These control centers also contain the starting boxes with remote control switches being provided at convenient locations for the operators.



One of the two 6,250 KVA Westinghouse turbo-generators.

Woodlands

The St. Regis Paper Co. and subsidiary corporations, the Alabama Pulp & Paper Co. and the Florida Pulp & Paper Co., have control of more than 400,000 acres of woodland in the vicinity of Pensacola. On a sustained-yield basis this acreage should supply enough wood to produce 120,000 to 140,000 tons of pulp per year. In addition, wood is being bought from owners of private woodlands. These owners are being educated and encouraged to operate their present holdings on a sustained yield basis and to extend their holdings by planting idle land.

A large nursery has been established near the mill site. When it reaches full production this nursery is expected to provide 7,000,000 seedlings per year or about 18 trees per acre of mill-controlled land. This is adequate to provide replacement for the annual cutting on mill property and allow a substantial number for distribution to private woodland owners.

When full production is attained in the Alabama Pulp & Paper Co. and the Multi-Wall bag plant, the entire project, including the Florida Pulp & Paper Co., will employ 2,200 persons in the plants and an additional 1,800 in the woods. These 4,000 employes will receive an annual payroll of about $10,000,000.

This great Kraft Center will stand as a monument to the men whose vision and efforts made it possible. Men such as James H. Allen, president of the Alabama & Florida companies and a director of St. Regis; Roy Ferguson, president of St. Regis; the late J. G. Pace, and his sons, A. D. Pace and J. C. Pace, have made this dream come true.

E. R. Gay, director and vice-president of St. Regis, directs the packaging division which includes the manufacture of Multi-Wall bags and automatic filling machines. He has played a leading role in the growth of the Multi-Wall bag as an industrial container.

Equipment and Material Supplies

Babcock & Wilcox Co. *Power boiler; two recovery units; bark boiler and all auxiliaries.*

Bailey Meter Co. *Meter and process*

regulating equipment. (Instrumentation)
Black-Clawson Co. *Paper machine.*
Bristol Co. *Meter and process regulating equipment. (Instrumentation)*
Buffalo Forge Co. *Draft fans.*
Bushnell-Lyons Iron Works, Inc. *Steel plate work, chutes, hoppers, miscellaneous steel.*
Calvert Iron Works. *Miscellaneous steel.*
Chicago Bridge & Iron Co. *Digestors and all steel storage tanks.*
Construction Equipment Co. *Tractor crane.*
Coppus - Dennis Co. *Burner on lime kiln.*
Cornell and Underhill, Inc. *Pipe bends.*
The Dorr Co. *Causticizing plant equipment.*
Elliott Co. *Feed water heater, De-Super heaters.*
Foster-Wheeler Co. *Condensers; heat recovery systems.*
Foxboro Co. *Meter and process regulating equipment. (Instrumentation)*
B. F. Goodrich Co. *Conveyor belting.*
Goulds Pumps, Inc. *Water, liquor and stock pumps.*
Improved Paper Machinery Corp. *Brown stock washing equipment; Flat screens, thickeners and save-all.*
Ingersoll-Rand Co. *Air compressors.*
Jamar-Olmen Co. *Corrugated asbestos siding, roofing, flashing, pipe and tank insulation.*
Jeffrey Mfg. Co. *All conveying and elevator equipment.*
Link-Belt Co. *Chip screens.*
Magnus Metal Co. *Screen plates.*
Manning, Maxwell & Moore. *30-ton crane, 15-ton crane-turbine rooms.*
Mason-Neilan Co. *Meter and process regulating equipment. (Instrumentation)*
Midwest Piping & Supply Co. *Fabricated high pressure steam piping.*
Moore Pipe & Sprinkler Co. *All fire protection installation.*
D. J. Murray Mfg. Co. *Two chippers.*
Nash Engineering Co. *Pumps.*
Oliver Filter Co. *Lime mud filter.*
Otis Elevator Co. *Freight elevators.*
Ross Engineering Co. *Paper machine hood and vapor absorption and ventilating system.*
Sarco Mfg. Co. *Steam joints.*
Shartle Bros. Machine Co. *Jordans. broke beater, chest agitator and drives.*
Sullivan Machinery Co. *air compressor.*
Swenson Co. *Sextuple effect multiple evaporator.*
Toledo Scale Co. *Scales.*
Truscon Steel Co. *Steel sash.*
United Refractories Co. *Boiler and furnace settings — brickwork, kiln lining.*
U.S. Rubber Co. *Conveyor belting, rubber covering at rolls.*
Valley Iron Works. *Paper machine headbox.*
Virginia Bridge Co. *Structural steel buildings.*
Vulcan Iron Works. *Lime kiln.*
Waterville Iron Works. *Chip crushers.*
Westinghouse Electric Corp. *Turbine generators and auxiliary installations, switch gear, all motors and controls, transformer, paper machine electric drive.*
Westinghouse Electric Supply Co. *Lighting and wiring materials.*

St. Regis Multiwall Bag Plant

C. B. Cottrell & Sons. *Printing machinery*
Coty Machine Co. *Tubers.*
General Electric Co. *Electrical equipment.*
Harris-Seybold Co. *Cutter.*
Lake Erie Engineering Corp. *Presses.*
Lamson Corp. *Conveyor.*
New England Tank & Tower Co. *Tanks.*
Pfeeger Business Equipment Co. *Steel racks.*
Potdevin Machine Co. *Bag making machinery.*
H. G. Weber Co. *Bag making machinery.*

Flambeau Improvements

The starting operations of the chemi-pulp process installation in October will mark completion of an extensive program of improvement at the Flambeau Paper Division of The Kansas City Star Company. This mill, located near the center of Wisconsin at Park Falls, was the property of the Flambeau Paper Co., before being acquired by the present owners in January, 1947.

In addition to the chemi-pulp process, other major improvements totaling almost $325,000 dollars have been made. These include installation of a new boiler plant with a capacity of 90,000 pounds of steam per hour; a Fairbanks-Morse Diesel with a generator supplied by Electric Machinery Mfg. Co.; a size press built by the Beloit Iron Works and equipped with a General Electric drive, and a bleacher which was built by Stebbins Engineering Co.

Pacific Mills Ltd., Starts Four 3½ Ton Digestors

Pacific Mills, Ltd., placed the last of its four new 3½ ton digestors in operation at the Ocean Falls, B. C., plant on August 20. This plant was established in November, 1917, and was originally equipped with four rotary digestors of two-ton capacity and German make. In 1926 new digestors, also of German make, and two-ton capacity, were installed.

In 1936 a third battery of digestors was installed, each with a capacity of 2½ tons, these being manufactured in the United States by the Kellog Co.

In the latter part of 1945 it became evident that a further replacement program would be necessary to keep the mill at top efficiency. Once again increased pulp demands had to be considered and the inevitable forward trend was reflected in still larger installations. The latest digestors exceed their predecessors in almost every dimension and respect. Instead of a shell thickness of 1½ inches, as was the case in the Kellog vessels, a 2-inch shell was specified in the major portion of each digestor with a 3½-inch thick belt, four feet wide, around the middle body for added strength at the point of suspension. As building dimensions prohibited further end - to - end increase, extra size was obtained by increasing the girth from an internal diameter in the case of the 2½-ton digestors of nine feet 10 inches to 11 feet 11 inches in the new 3½-ton digestors. The new digestors are trunnion mounted and differ from those just removed in that there is not a shaft extending through the interior of the vessel. They were manufactured by the Vancouver Iron Works in Vancouver, B. C.

With the four new digestors now in operation, the mill has a potential capacity of 175 tons of air-dry kraft pulp per day.

This installation completes another important step in the over-all program designed to keep the mill operating at maximum efficiency.

Pacific's Power Plant Operating

Another stage in the postwar development program of Pacific Mills, Ltd., was completed when the company's million dollar power plant swung into operation recently.

Designed and manufactured by Babcock-Wilcox & Goldie-McCulloch, Ltd., Galt, Ont., the unit has an operating pressure of 725-lbs., per sq. in. at 750°F and steaming capacity of 175,000 lbs., per hour. The boiler weighs approximately 750 tons.

Charles C. Moore & Co., engineers of Vancouver and San Francisco, erected the boiler and Siedelman, Shields & Co., the housing and structural steel.

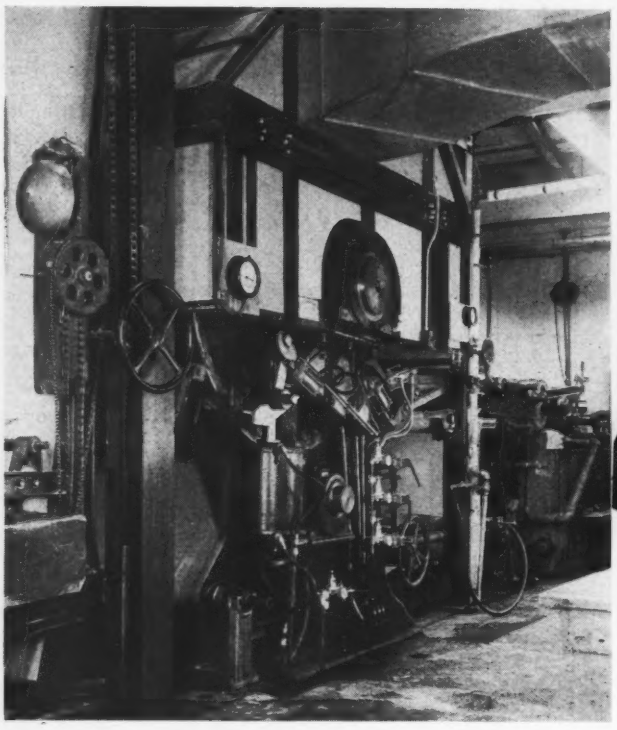
Operating in conjunction with the boiler are two new steam turbo generators. One was manufactured in Zurich, Switzerland, the other is a General Electric machine.

In addition, an extensive program of steam repiping has been completed, including a 3,000 gal. storage header for pump suctions, new oil heaters and new pumps, etc. Extensive electrical work has also been carried out, and motor controls for the new and existing boiler plant motors have been installed. Over 5,000 ft. of four-inch conduit and three conductor cables have also been laid, to distribute the power generated by the new turbo generators; and complete overhaul of the mill substation switch gear is well under way, it is stated.

Sandy Hill

HELPS PUT THE STRENGTH AND SOFTNESS INTO

Golden Fleece Tissues



Photograph courtesy of Brown Company

Producing an extra high grade tissue like Golden Fleece presents problems. Sandy Hill is proud of the result.

One of the two Sandy Hill Cylinder Machines just installed in record time in the Golden Fleece Co., Inc. plant in Bancroft, Mass.

At the "Golden Fleece" plant in the record time of eight weeks, two old machines were ripped out and necessary floor changes made, two new machine sections installed by Sandy Hill, and saleable paper resumed rolling into the converting room.

This is one of a wide variety of Sandy Hill's recent installations, which include a 132 inch (wire width) Fourdrinier in Ohio, and 80-dryer machine for roofing felt in New Jersey, two facial tissue machines in New York and a long list of other paper machines and specialties.

Sandy Hill Iron & Brass Works

Hudson Falls, N. Y.

Machinists and Founders Specializing in Paper and Pulp Mill Machinery.

Manufacturers of
Adjustable Cylinder Vats
Cylinder Paper Machines
Pulp Grinders
Dandy Roll Drives

Pulpers or Kneaders, Voith
Thickeners
Quick Opening Gate Valves
Bertrams Flow Distributors
Bertrams Shakes

Nelson Slice
Feltless Wet Machines
"Selective" and Corner Drives
Fourdrinier Paper Machines
"Packer" Screens

Castings
Bleaching Equipment
Scofield Felt Conditioners
Cleveland Type Bearings
Shaker Screens

General View of mill, office at left.

Golden Fleece Co., Inc.

In a setting of unusual beauty, in the Berkshire hills of Massachusetts, there is a small paper mill producing what is probably the top-ranking product of its type. This mill produces only one grade, one weight, one quality of facial tissue. The single-ply weight is 9½ pounds 24 x 36 x 480.

The mill was originally built sometime prior to 1873 and was owned by the Bulkley, Dunton Co., until 1913. In 1894 the mill burned down and was completely rebuilt. Since 1913 the mill has been operated under the names of Union Mills, then Beckett Paper Co., and Federated Mills, until 1946, when it was taken over by the Golden Fleece Co.

In the spring of 1948 the two paper machines were replaced with two new machines built by the Sandy Hill Iron & Brass Co. The machines were replaced one at a time so that there was no complete interruption of operations. The changeover was completed in July with a minimum loss of production.

The mill is situated on the West Branch of the Westfield River and is served by the Boston & Albany Railroad. A siding leads from the main line of this railroad to a new warehouse owned by the mill. This warehouse is 100 feet long by 40 feet wide and is built entirely of metal except for the floor, which is concrete. The frame is of steel girder construction and the roof and walls are of sheet aluminum.

Shipping and Storage

There is a loading platform along the railroad siding on one side of the building and a truck dock on the other side. Most of the raw materials and supplies coming to the mill, as well as most of the products shipped out, are carried by rail and consequently pass through this building. The incoming pulp is stored here until used. The outgoing products are kept only for the time required to load into railroad cars. All transportation from the warehouse to the main part of the mill is handled by company trucks.

HARRY ENGLANDER
President
Golden Fleece Co.

Beater Room

The beater room contains two 2,000 lb., E. D. Jones beaters; one for each of the two paper machines. These beaters have just been rebuilt to increase the capacity from 1,700 to 2,000 lbs. Each beater is equipped with a Foxboro roll-pressure recorder, which allows accurate reproduction of beater roll pressures for each batch of stock.

The beater room is quite large, containing about 6,000 square feet of floor area. This allows for storage of a considerable quantity of baled pulp within easy loading distance from the beaters. The pulp is brought by truck from the new warehouse to the loading platform just outside the beater room.

Each beater has its own tile chest equipped with propellor agitators. These chests are about 12 feet in diameter by 18 feet high and each will hold three beaters of stock.

From each beater chest the stock is pumped to a refiner head box and consistency regulator and then flows by gravity through a refiner.

These refiners were built by E. D. Jones Co., and are powered by 20-H.P. motors running at 900 R.P.M. The refined stock is pumped to the mixing box where it is diluted to about 2 percent consistency before going to the paper machine vats.

Paper Machine

The two paper machines are practically identical in every respect, or perhaps we should say they are mirror images of each other, since one is a left-hand machine and the other is right-hand. The position of the ma-

Interior of aluminum sheathed warehouse showing baled Solka pulp in foreground; cases of finished tissue in background.

chines with reference to each other, is rather unusual, in that they are lined up in reverse tandem, with the wet ends at opposite sides of the building and the dry ends coming together in the middle

The vats were designed by F. V. Munn, plant manager, and built in the mill shop. They are made of wood with steel bracing and are the reverse-flow type.. That is, the stock enters the vat at the forward side where, the cylinder face is traveling downward. The forming board is located on the opposite side, below the surface, about ten inches from where the cylinder emerges.

The cylinders, which were designed and built by Sandy Hill, are 36-inch in diameter and have 84-inch faces. The mat is couched from the cylinder to the top felt by a rubber covered couch roll, 18½ inches in diameter with a 88-inch face. Each machine is equipped with three Scofield suction pipes and one Scofield felt conditioner.

The Yankee driers (one for each machine) are six feet in diameter by 96-inch face. The center of the drier is suspended directly above the pressure roll and its weight is used to supply the pressure required to seal the wet sheet to its surface. A large air cylinder is used to raise the drier from the press roll and also to adjust the pressure as required.

Most of the roll doctors were supplied by the Lodding Engineering Co., and are equipped with compressor cylinders to apply the pressure against the roll. All of the compression cylinders and auxiliary apparatus, both for the doctors and for raising and lowering the Yankee cylinder, were supplied by the Bellows Co., Akron, Ohio. Two Ingersoll-Rand compressors supply the compressed air necessary to operate the equipment.

Both paper machines are equipped with Syco drives, each consisting of two variable-speed units driven by 100 H.P. Westinghouse A.C. motors.

The Syco Drives are multiple V-belt units with continuous speed variation obtained through vari-pitch sheaves. Speed changes are made on each unit by means of a handwheel and the speed of entire machine is changed with remote controls that operate all units in synchronism.

The hood is supplied with dry air at 185°F by an external heater. Part of the air drawn from the hood is returned to the heater and part is exhausted to the atmosphere. Each machine is equipped with a separate air system and hood supplied by J. O. Ross Mfg. Co.

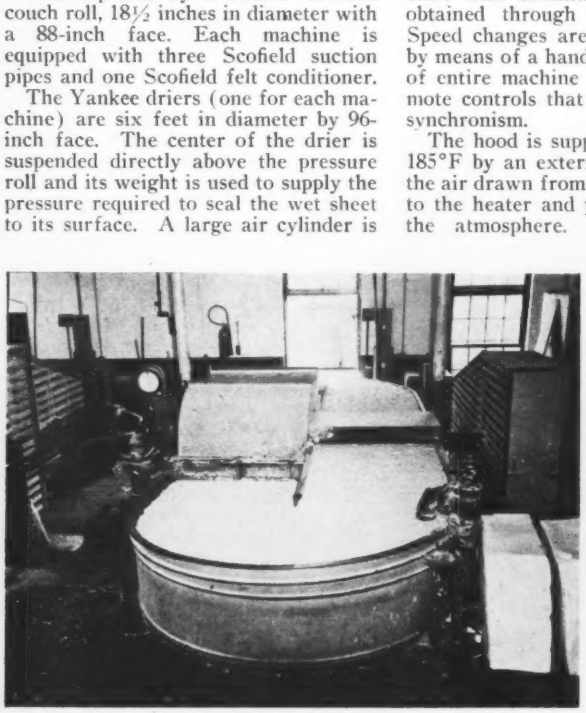
The dried web is removed from the Yankee drier by the creping doctor, which may be adjusted to produce the desired amount of crepe. The sheet is then carried, on a drier felt, over the tope of the hood and thence over a revolving drum where the paper leaves the felt and passes through a single calendar nip having very light pressure. The drum is merely an unheated 36-inch drier roll that is used to change the direction of the web.

A rather unusual method is used to obtain a two-ply sheet at the end of the machine. Two reels are used, the web being wound on a swinging reel first. When the roll of paper reaches the proper diameter, the sheet is transferred to a stationary reel. At the same time the paper on the swinging reel is wound on the stationary reel with the web coming from the paper machine. This results in a two-ply sheet which is then transferred to the combination embosser, slitter and rewinder. There is only one of these units, located between the paper machine winders and serving both paper machines. Two rolls of double-ply paper are embossed, slit and rewound together making rolls of four-ply paper. The embossing provides edges which hold the four plies of each tissue together. The machine is equipped with ten double embossing wheels, the paper being slit in the middle of each embossed portion.

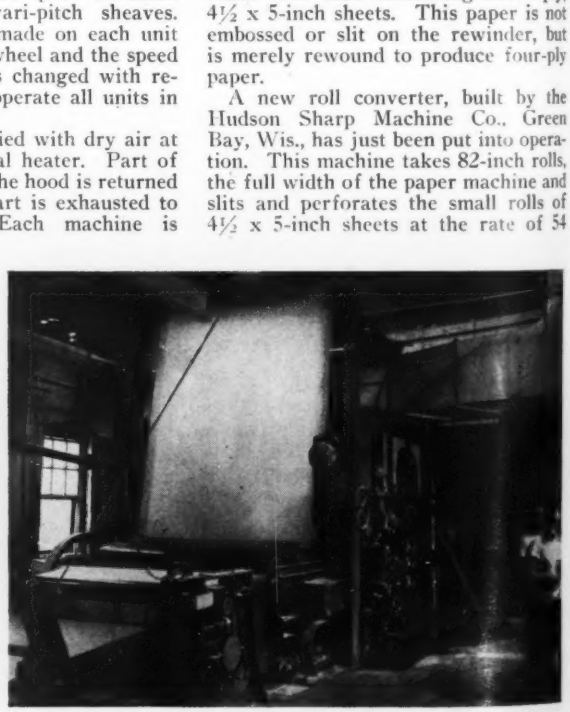
Roll Converter

Some of the paper is converted to small rolls each containing 200 4-ply, 4½ x 5-inch sheets. This paper is not embossed or slit on the rewinder, but is merely rewound to produce four-ply paper.

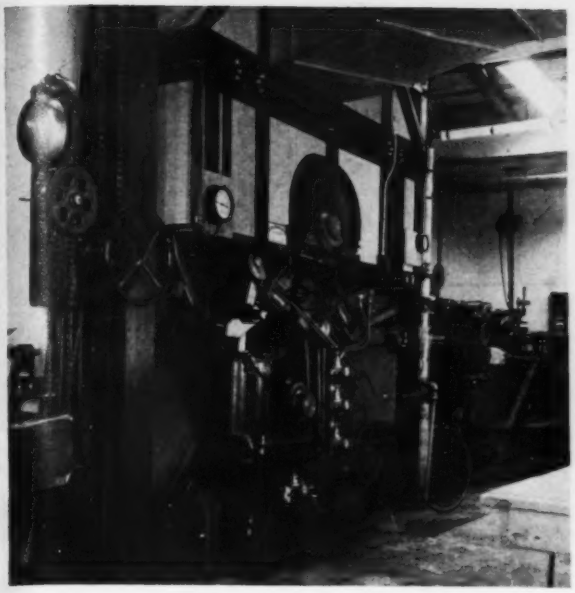
A new roll converter, built by the Hudson Sharp Machine Co., Green Bay, Wis., has just been put into operation. This machine takes 82-inch rolls, the full width of the paper machine and slits and perforates the small rolls of 4½ x 5-inch sheets at the rate of 54



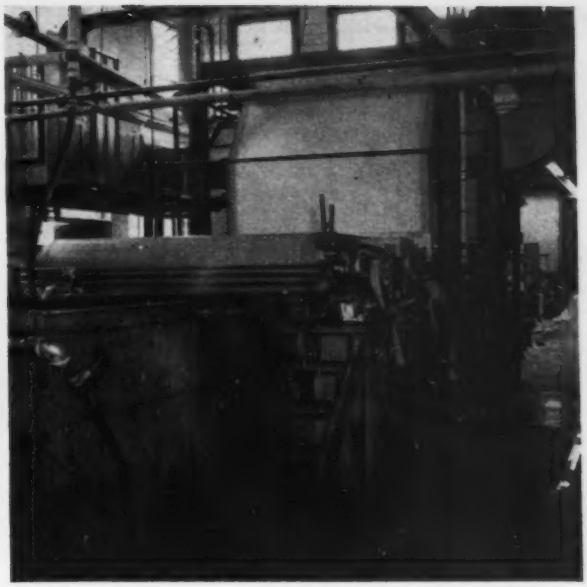
No. 2 beater. Motor of No. 1 beater at left.



No. 1 paper machine, reels and calender at left.



Yankee drier and hood of number one paper machine.



No. 2 paper machine as seen from the wet end.

per minute. This machine also slits the cores, thus allowing the use of the full length 82-inch tubes. These cores are covered with glazed paper having an almost frictionless surface. This allows the user to remove the cores from the roll and unwind the paper from the inside of the roll without removing the entire wrapper.

Sheet Converters

The paper that is to be converted into folded sheets for boxing may be slit into single or double width rolls or, as is usually done, the 82-inch roll from the paper machine is slit into one 60-inch roll and one double-width roll, 17.2 inches wide. The two tissue converting machines which were built by the Hudson Sharp Co., slit the 60-inch rolls into seven sheets which are then Z-folded and wound on large reels. These reels automatically reduce their diameter with each revolution and thus make each turn of the paper exactly the same length as those above and below it. When from 122 to 125 turns are made on the reel the machine is stopped and the cut-off knife is brought across, making seven strips, each containing about 123 4-ply Z-folded sheets. The lengths of these strips is different for each of the two machines, one making strips 12 feet long, the other producing six-foot strips. The length of these strips is determined by the diameter of the winding reel.

After being cut-off the strips are removed from the reel and placed in slots on the cutting table which is then moved through a series of rapidly revolving slitter knives. Here the strips are cut into packs, each nine inches long. The top and bottom sheets are discarded, leaving 120 to 122 four-ply sheets in each pack or enough for two boxes of 60 each.

Packaging

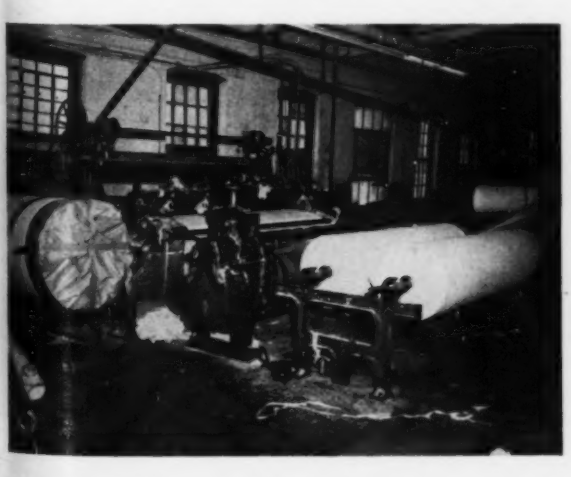
The packs of tissues are carried from the cutting table to packaging table on a belt conveyor. Before being put into boxes each pack of tissue is inspected for faulty folding or cutting. Unsatisfactory material is removed for return to the beaters.

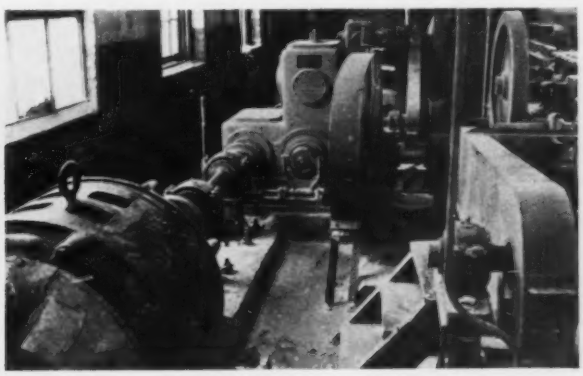
The boxes of tissues are carried on a conveyor to the point where they are packed in large corrugated containers, 48 boxes to each container. A roller conveyor takes the containers to the floor below where they are sealed and sent to the loading platform.

Power Plant

All electric power for the mill is purchased from the local utility. A substation equipped with three Westinghouse transformers and a General Electric Watthour meter is located outside the beater room. There transformers reduce the voltage from 22,000 to 550, three phase 60 cycle.

Steam for process and heating is supplied by two coal burning Dillon Boilers. These boilers are equipped with stokers and each has a capacity of 6,000 pounds of steam per hour. Usually





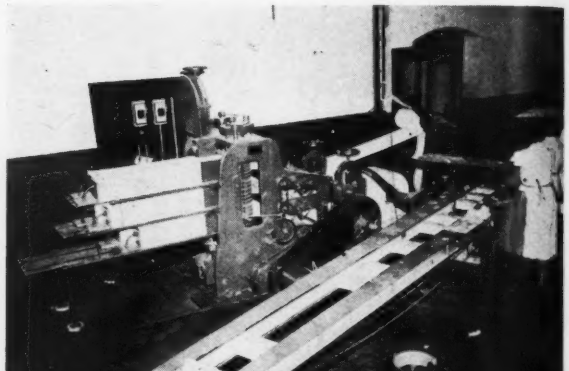
↑ No. 1 machine Syco drive. Westinghouse A.C. drive motor at left.

← LEFT: Combination embosser slitter and rewinder.

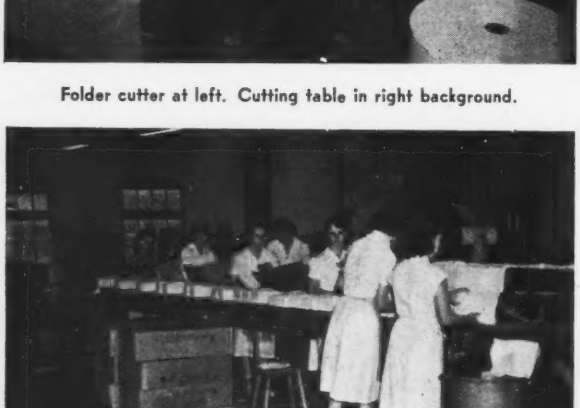
Hudson-Sharp tissue roll converter.

Hudson-Sharp folder-cutter; facial tissue converter.

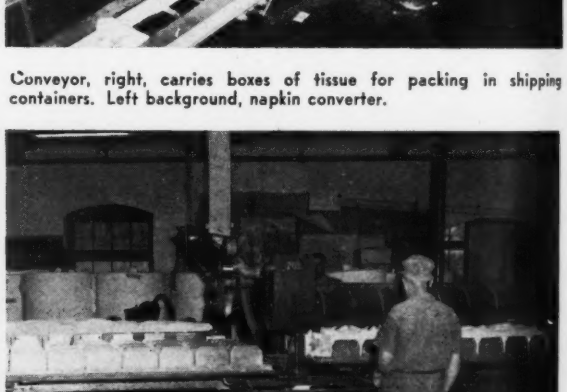
Folder cutter at left. Cutting table in right background.



Conveyor, right, carries boxes of tissue for packing in shipping containers. Left background, napkin converter.



Packaging line. Here the packs are inspected and boxed.



Cutting table for producing flat packs of facial tissue.

one of these boilers will supply all of the steam requirements, the other being used as a stand-by.

A new Westinghouse panel board has been installed near the beater room. This board contains the switchgear for both paper machines and beaters. Remote control buttons are then located at points convenient for the operators.

Service and Administration

The mill is equipped with repair and maintenance facilities which are unusual in a mill of this size. Completely equipped machine and wood-working shops, plus excellent facilities for electrical maintenance, make it possible to reduce lost production time to the absolute minimum.

An excellent clubhouse, situated on a hillside near the mill, provides comfortable living quarters and delicious meals for unmarried workers and mill visitors.

The present operating and executive staff of the Golden Fleece Co., include

THE ARISTOCRAT OF TISSUES

calls for highest grade of purified cellulose

The manufacture of delicate facial tissues calls for the utmost in purity, mellow softness and those perfectly blended properties which produce unmatched absorbency with phenomenal strength.

The makers of quality items such as "Golden Fleece" insist on Brown Company's Solka*... the very finest grade of purified cellulose. The back of every "Golden Fleece" package, as well as consumer and point of sale advertising, carries the Solka Seal—indicating 100% SOLKA content—to further this identification of highest quality to the consumer.

Here is another example of Solka serving the needs of those discriminating manufacturers whose reputations are based on products of truly outstanding quality.

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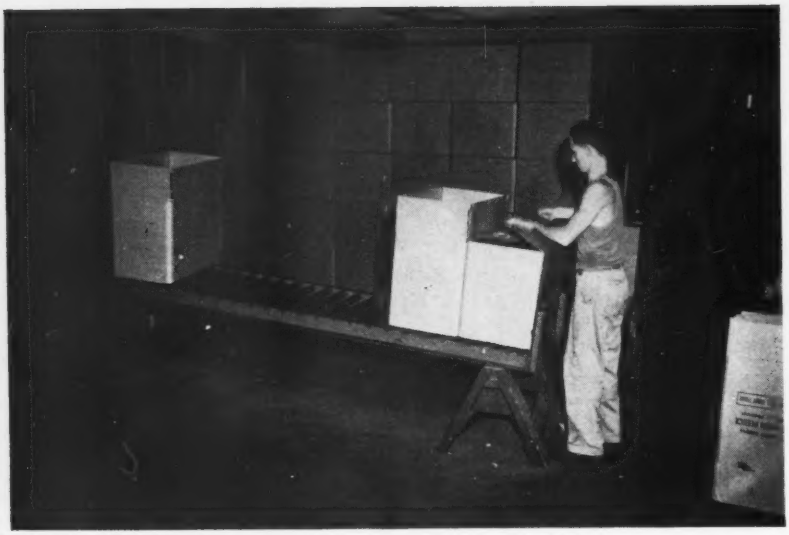


Sealing the finished shipping containers.

the following: Harry Englander, president; Frederick Munn, plant manager; Roy Wheeler, superintendent; Arthur Valorose, machine foreman; Harold Balch, machine foreman; George Mitchell, purchasing agent; Walter Conrad, plant engineer; William Manton, converting superintendent; and William Frisbie, traffic manager.

These men are to be congratulated for the excellent job of modernization which they have accomplished.

EQUIPMENT AND MATERIAL SUPPLIERS

Frank Adam Electric Co., *Switch boxes.*

Arrow-Hart & Hegeman, *Switch boxes.*

Bristol Co., *Recording tachometer, steam gauge.*

Brown Co., *Solka pulp.*

Butler Mfg. Co., *Aluminum, siding and roof for warehouse.*

Clark-Aiken Co., *Rewinders.*

De Zurik Shower Co., *Consistency regulators.*

Foxboro Co., *Pressure controls on Yankee pressure roll, beater rolls, etc.*

General Electric Co., *Motors, watt-hour meter.*

Gilbert & Nash, *Dryer, felt guide.*

Harrington Mfg. Co., *One-ton roll hoist.*

Hudson Sharp Machine Co., *Embossers, tissue converting machines.*

Ingersoll-Rand Co., *Compressors.*

E. D. Jones & Sons Co., *Beaters, small refiners.*

Lodding Engineering Co., *All doctors.*

Morse Chain Co., *Chain drives.*

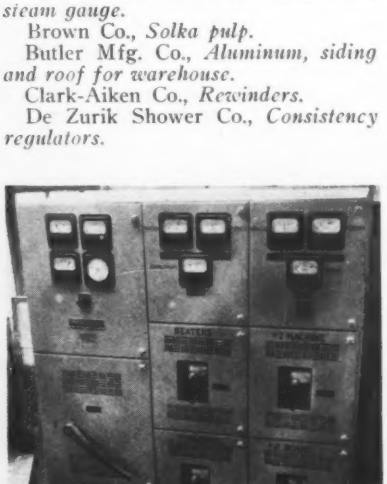
J. O. Ross Engineering Corp., *Hoods, air heating system.*

Sandy Hill Iron & Brass Wks., *Paper machines.*

Star Electric Co., *Motors*

Syco Mfg. Co., *Paper machine drives.*

Westinghouse Electric Corp., *Paper machine drive motors, electronic control panel, transformers.*



New Westinghouse central panel board.

Sonoco Expands

The following additions and improvements were made by the Sonoco Products Co., Hartsville, S. C., during the past year:

Installation of a 126-inch trim Fourdrinier machine with wet end by the Downington Mfg. Co. and dry end by the Bagley & Sewall Co. The machine is set up to make .009 corrugating board. In connection with this machine a 12-foot Shartle Hydrapulper has been installed, two 36-inch Sprout Waldron refiners, two Shartle Miami No. 2 Jordans and two Impco flat screens. Also, two Shartle deckers and two Oliver filters.

In connection with this, a pulp wood yard has been built with concrete flume and chain conveyor. The barking drum has been relocated and a new chipper building built. The conveyor and elevators in the chipper building are by Webster and the chip screen is of the Robbins type. The chip crusher is by the Waterville Iron Works. A chip conveyor has been installed from this building to the pulp mill. A Lorain crane has been purchased and will be used with a grapple orange peel bucket on the wood yard. In revamping the pulp mill, two Brown stock washers by Oliver have been installed, along with one new 15-foot Biggs rotary digestor and three Sprout Waldron 900 rpm refiners.

The pump installations are by Gould and Warren & Nash. Ventilating system for the Fourdrinier machine is by J. O. Ross, and the dryer drainage system is by Midwest Fulton. Westinghouse turbine drives are used on the machine and a Foxborough Verigraph moisture control has been installed. It has a nine-roll calender stack, Pope type reel, Bagley & Sewall rewinder. Two Maris cranes have been installed, one a building crane running the entire length of the machine and the other a single rail crane over the dry end.

New equipment for our other paper machines include a Miami Jordan, seven Shartle thickeners and new drives on two machines. One drive is by Bagley & Sewall and the other by Downingtown. Approximate total cost of improvements and new equipment added totals $2,000,000.

Knowlton Brothers Modernization

For the past three years, the Knowlton Brothers Co., Watertown, N. Y., has been executing a long-range program of modernization. This included, among other features, a complete new boiler plant with two Babcock & Wilcox boilers, each having a capacity of 16,000 pounds of steam per hour.

A Westinghouse sectional electric drive was installed on No. 1 machine in 1946. A Westinghouse turbine will soon be added to this equipment. On No. 2 paper machine a General Electric turbine will soon be in operation as the prime mover.

A complete new transformer substation built by Westinghouse was one of the first parts of the modernization program put into operation. All of the main switchgear was modernized at the same time.

During the past few months, Bird Savealls have been added to both machines and Bird Dirtec installations have been put into operation.

New Ross hoods were recently installed on both machines and No. 1 machine was equipped with a new E. D. Jones Jordan.

When the program is completed within the next several weeks, more than $250,000 will have been invested in making this mill one of the most modern of its kind.

Water filtration plant constructed at Mando's International Falls mill. This unit, with a 15-million gallon capacity, will go into operation some time this Fall.

Mando Keeps on Growing

Reflecting continuous operations and increased volume, materially aided by plant modernization and additions, the Minnesota & Ontario Paper Co. has maintained an enviable record of progress and expansion during the past year. Net sales figures recently announced by Donald D. Davis, president, for the six months ending June 30, were $25,966,341. This compares with $23,879,413 for the same period in 1947.

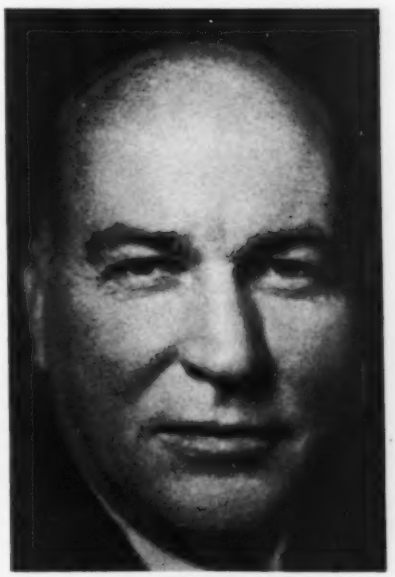
President Davis pointed out that Mando has undertaken a comprehensive program of modernization, improvement of the existing faciilties, and construction and addition of new facilities now nearing completion, entailing an authorized expenditure of over $12,000,000. The company is meeting all expenditures for this program without borrowing money or issuing additional stock. A substantial majority of these expenditures is going into the construction and equipping of additional plant units as a part of a broad program to upgrade Mando products for the manufacture of higher grade papers, President Davis added.

There were numerous major improvements in production and service facilities as well as addition of new equipment during the past year at the various Mando mills. The objective was more production and greater sales than ever before. In addition to the expansion of physical property and equipment, there has been the development of new techniques and streamlined production methods.

Details of this program as it applies to the various mill locations can be summed up as follows:

International Falls Mill—As a vital part of the upgrading of the various paper products, Mando has recently completed a water filtration plant with an immediate capacity for 15,000,000 gallons per day, and provision for expansion to 30,000,000 galoins. This unit, utilizing the Permutit Spaulding precipitation coagulation system, followed by sand filters, will be placed in operation this fall.

Additional steam for Mando's expanding operations became available this spring when a new 150,000-pound steam boiler went into operation at the Falls plant. Teamed with a similar steam generator of 85,000 pounds per hour capacity, installed in 1942, and five Heinie boilers, the new giant is expected to meet the steam requirements of the mill for some time.



DONALD D. DAVIS
President
Minnesota & Ontario Paper Co.

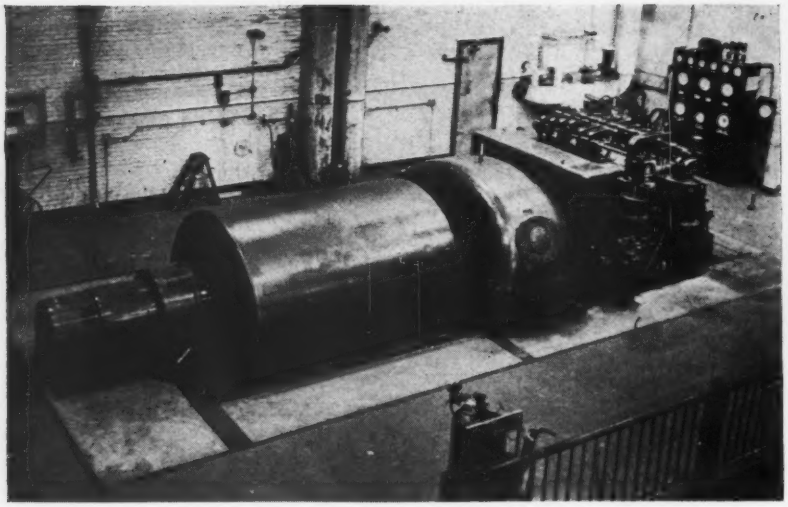
With a guaranteed efficiency of over 85 percent, the new Combustion Engineering unit will produce 150,000 pounds of steam per hour at a pressure of 450 pounds per square inch.

Mando officials said the installation was required to meet present and future requirements growing out of expanding manufacturing facilities. Its output will supplement the other boiler capacity to supply the two new 7,500-KW turbo-generators installed to meet the increasing demand for electrical energy.

Each of these two new turbo-generators weighs approximately 81 tons and occupies a foundation 35 feet by 25 feet in area. These two larger units will supplement the output of two 4,000-KW generators which have been in operation for a number of years.

The turbines are of the double-extracting, mixed pressure, condensing type to assure the most economical use of steam. They operate at a steam pressure of 450 pounds and at a normal speed of 3,600 rpm. With these two units installed, the generating capacity of the turbine room at the Falls plant totals 23,000-KW, the equivalent of more than 30,000 hp.

In order to increase the productive capacity of the plant, four new barking drums, each 12 feet by 45 feet, were recently installed, replacing units which were 10 feet by 30 feet. It is esti-



Two 7,500 KW turbo generators, one of which is pictured here, were installed as part of Mando's modernization program.

mated that this replacement will result in a 50 percent increase in barking capacity.

Wood-handling facilities have also been modernized with the addition of two new Diesel locomotive cranes enabling the woodyard to more adequately supply the needs of this increased capacity in wood preparation.

A new seven-ton kraft digester has been installed to supplement the two existing digesters. This new unit means a 25 percent increase in kraft pulping capacity. It also adds considerable flexibility in maintenance and repair work. The old kraft barking drum is being replaced with a new 12-foot x 67½-foot drum to fill the need for more wood, occasioned by the utilization of this new unit.

In line with this program of the upgrading of paper products, Mando is installing groundwood and kraft bleaching facilities and equipment. The kraft bleachery will be a six-stage, 100-ton system. With the buildings to house these facilities almost complete, and a major portion of the equipment on hand, it is expected that bleaching facilities as well as the new water filtration system will be inaugurated late this fall.

In anticipation of producing bleached paper products, Mando's No. 4 paper machine will undergo considerable modernization. Two new presses, a new Foudrinier, seven new driers, a new size-press, as well as a new stock preparation system will be installed. New Bird screens will also be emplaced, and the machine will be powered by an electrical drive.

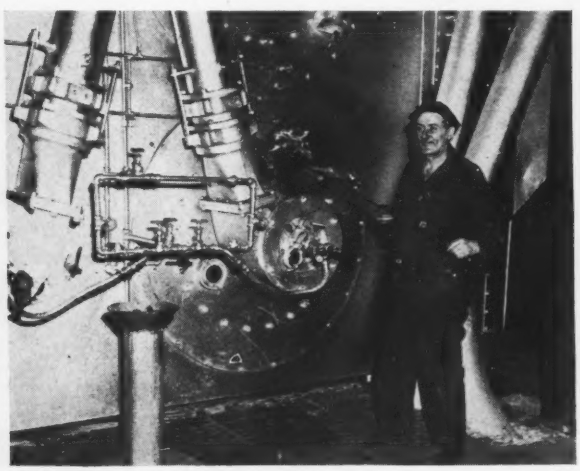
The first supercalendered paper ever produced by the company was shipped late last fall. Present production of supercalendered paper is being accomplished on an 80-inch machine manufactured by the Appleton Machine Co. It is fitted with a semi-automatic unwinder and winder which is synchronized to permit roll changes without stopping. Top speed of the machine is 1,850 feet per minute. Two additional supercalenders have been installed, but have not been placed into operation. The 100-inch machine will be in operation within a month, while the 60-inch calender will be operative in late fall.

Another feature of the modernization at the Falls mill is the replacement of the pocket grinders with five Great Northern grinders, greatly increasing the capacity of the grinder room.

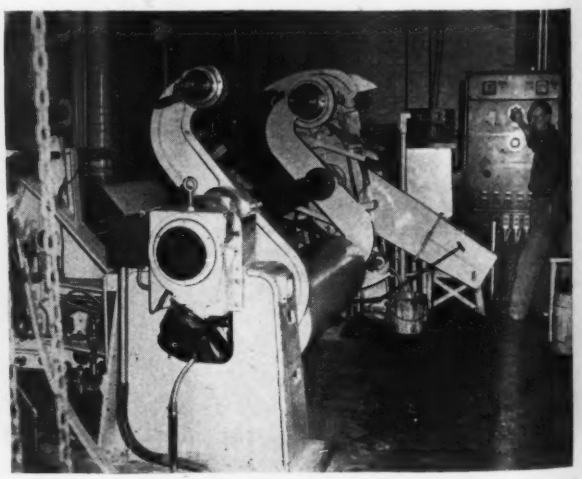
Fort Frances, Ont. Mill—Required extensions to No. 3 groundwood mill were accomplished recently. Construction was undertaken to house eight additional pocket grinders. They were set up in two lines of four each, and provide the increase in the number of stones necessary to produce the quality and quantity of high-grade pulp desired.

A new boiler unit capable of producing 85,000 pounds of steam per hour, is presently being installed to replace units of smaller capacity, increasing the steam supply necessary to meet the new requirements imposed by the general modernization program. This new unit, which is of the most modern type, is automatically controlled. It is to be stoker fired, is complete with water walls, superheater and forced and induced draft equipment.

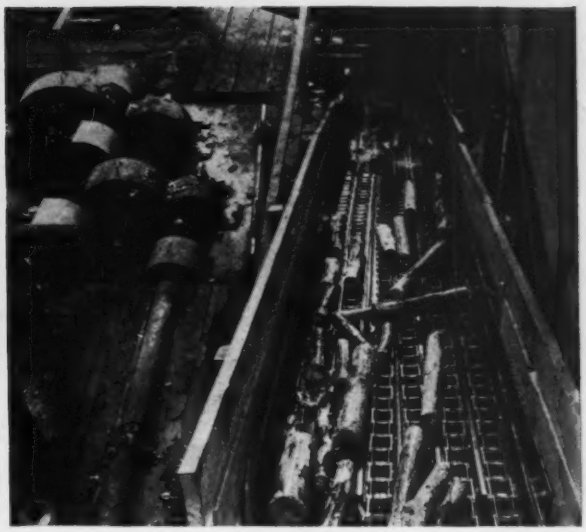
No. 6 paper machine is to be completely modernized, converting it from the manufacture of newsprint to that of higher grade groundwood printing papers. The modernization features include a new slice, improvements to the Fourdrinier and the installation of a suction couch. The press section is also being modernized and a smothing press installed. Six additional paper driers are being added, and a new Pope type reel and Cameron winder are being installed at the dry end. Another feature of this modernization is the substitution of a new modern electric drive on this machine for the steam engine drive formerly employed. A fluorescent light-



Leonard Walker, fireman, lights new 150,000-pound steam generator recently installed at Mando's International Falls mill.



Kohler winder where supercalendered paper emerges after passing through stack. Operator on duty is Harry Hanneman.



ABOVE and at LEFT: Two views of the Jeffrey conveyors.

ing system has also been installed to better light the paper machines.

A large number of additions and improvements to the mixing and color rooms were completed this year and the groundwood screening and thickening facilities were considerably improved with the installation of new tile lining and agitators. The fine screening system was substantially enlarged.

Among the new marine equipment to be added is a 37-foot steel warping tug recently purchased. A fleet of four new trucks has also been purchased.

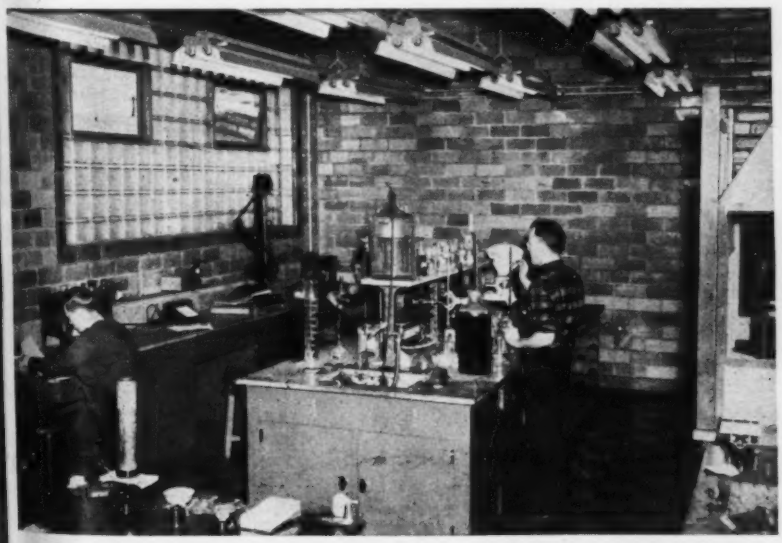
Kenora, Ont., Mill—Additional wood preparation faciilties were installed at the Kenora mill with the adition of a Circo barking drum and a new sorting table which materially increased the barking capacity of the wood room.

Calender stack drives for the two paper machines were both replaced, increasing the efficiency and aiding proper operating synchronization. Economizer units were installed on No. 8 machine also, and the first press was replaced and modernized. On No. 9 machine the single vacuum box was replaced with a two-compartment box, and provision was made for additional pumps.

The centralization of production control activities in the Kenora mill was completed early this spring with the arrival of long-waited laboratory furniture, consisting of steel work tables with acid-proof tops. Installation of this equipment was the final step in constructing and equipping the fine new laboratory at the mill.

The laboratory, built of brick and tile, in the northwest corner of the mill, and completed last fall, is practically fireproof. The inside walls, of glazed tile, present a smooth, bright surface. Large windows of glass brick, providing abundant natural light. Heating of this building embodies radiant heating principles. Hot water piping, built into the floor, turns it into a heating unit. This method of heating is reported to have proved very successful during the past winter, which was particularly severe in this part of the country. The laboratory itself consists of three rooms; a main testing laboratory, a groundwood testing laboratory, and an office.

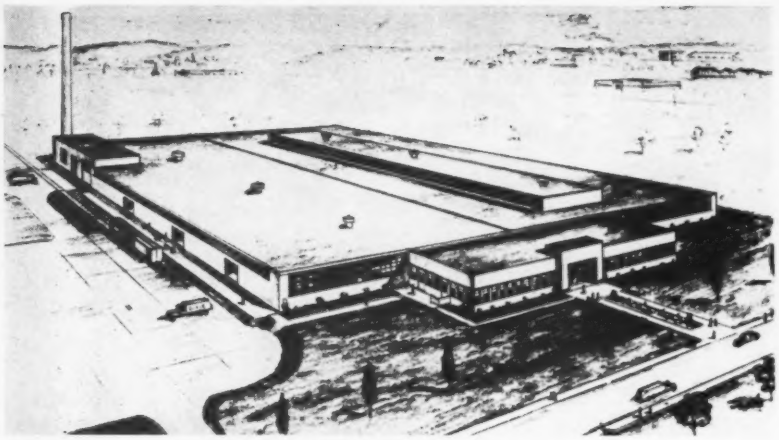
As a part of the present program of modernization, with the aim of making Mando products the best in the industry, the Kenora laboratory is an integral part of that aim, which will be of benefit not only to Mando itself, but also to all who depend upon it for a livelihood.



The modern and well equipped laboratory at Mando's Kenora mill. At left, Ralph Mosher, chemical engineer, is engaged in jackpine research, while Bert Petch, assistant chemist, prepares solution for sulphite mill test.

Stream Pollution

The Minnesota & Ontario Paper Co., with two pulp and paper mills situated on Rainy River, one at International Falls and the other at Fort Frances, Ont., has quite a waste-disposal problem. As a part of its improvement program, Mando has appropriated $500,000 for installation of improved screens, save-all units and construction of a spe-



DIXIE PLANT FOR BRAMPTON, ONT.

THE DIXIE CUP CO. (CANADA), LTD., has signed contracts for erection of a manufacturing plant for Dixie Cups at Brampton, Ont. Construction will begin immediately and the plant is scheduled for completion within a year, including the installation of machinery . . . the plant having a total area of 50,000 square feet, will be of structural steel and brick construction. It will be designed exclusively for the manufacture of paper cups and containers. The plant will be served by a spur siding from the Canadian National Railway.

cially constructed boiler to practically eliminate discharge of bark and wood fiber from the mills into the river.

Equipment and Suppliers

International Falls

Power Equipment: Combustion Engineering Co., 150,000 lb. combustion steam generator; General Electric Co., two 7,500 KW turbine generators; Worthington Pump & Mach. Co., 8,500 sq. ft. condenser and auxiliaries; Combustion Engineering Co., four Diamond soot blowers (steam operated); Hagen Corp., combustion control system; Cutler Hammer Co., Unitrol equipment; Bristol Co., recorders; Bailey Meter Co., meters.

Filtration Equipment: Permutit Co., 15,000,000 G.P.D. filtration system; Ingersoll-Rand Co., pumps; Goulds Pump Co., pumps; Worthington Pump & Mach. Co., pumps; Link-Belt Co., conveying equipment; General Electric Co., motors; Westinghouse Electric Co., motors; Wm. Bros. Boiler & Mfg. Co., tanks; American Cast Iron Pipe Co., cast iron pipe.

Barking Equipment: Fibre Making Process Co., four 12′ x 45′ and one 12′ x 67½′ barking drums; Jeffrey Mfg. Co., pulpwood conveyors; Cameron Machine Co., re-winders; Westinghouse Electric Co., supercalender drives.

Steam Pollution Abatement Equipment: John Phillip Badenhausen, Inc., steam pollution — boiler; Wm. Bros. Boiler & Mfg., 150′ 7″ steel self-supporting stack; Wm. Bros. Boiler & Mfg. Co., steel tanks; American Defibrator, Inc., bark presses; Link-Belt Co., conveying equipment; Permutit Co., blow down system; Falk Co., speed reducers; Allis-Chalmers Mfg. Co., motors; Ingersoll-Rand Co., feed pumps and compressors; Cochrane Corp., de-rating feedwater heater; Bristol Co., recorders.

Grinding Equipment: Montague Mach. Co., five 4′ Great Northern grinders; Meyer Governor Co., five load regulators and auxiliary equipment; Electric Machinery Mfg. Co., five 3,000 H.P. generator motors; General Electric Co., electric switching equipment.

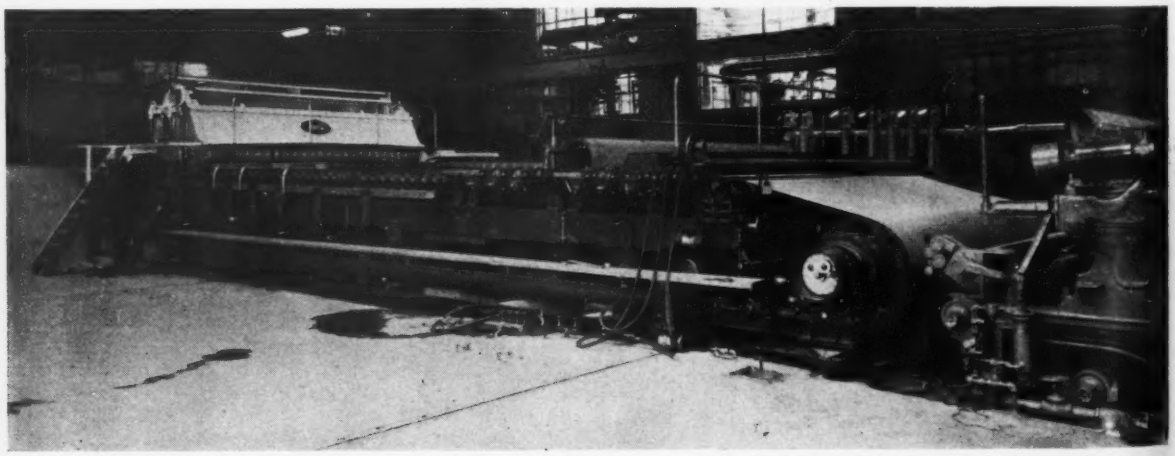
Kraft Bleachery: Improved Paper Machinery Co., bleaching machinery; Stebbin Engineering Co., tile tanks and towers; Bingham Pump Co., pumps; Ingersoll-Rand Co., pumps; General Electric Co., motors; Westinghouse Electric Co., motors; De Zurik Shower Co., plug valves; Ross Engineering Co., heating and ventilating.

Modernization of No. 4 Paper Machine: Pusey & Jones Corp., Fourdrinier-driers-size press-rolls; Reliance Electric & Engineering Co., drives; Chicago Bridge & Iron Co., kraft digester; American Hoist & Derrick Co., two Diesel electric cranes.

Fort Frances

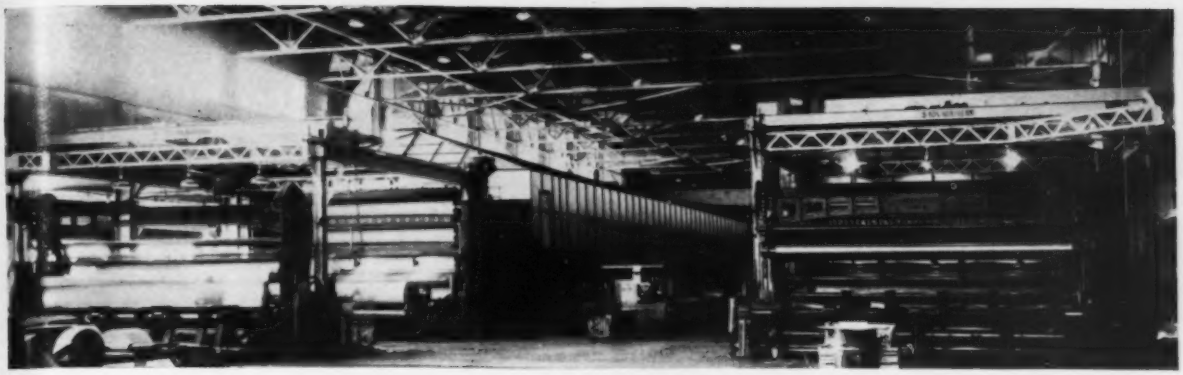
Babcock & Wilcox Co., 85,000-lb. boiler. *Modernization of No. 6 Paper Machine:* Dominion Electric Co., Fourdrinier and couch; Reliance Electric & Engineering Co., drives; Cameron Machine Co., winder.

Kenora Canadian Ingersoll-Rand, Ltd., barker.



P. H. GLATFELTER CO. SPRING GROVE MILL

In the summer of 1947 the P. H. Glatfelter Co. announced plans to invest $3,500,000 in a program of improvement and expansion for the mill at Spring Grove, Pa. Although the program is far from being finished, a great deal of work has been completed. The entire project has been under the direction of H. M. Wilson, Consulting Engineers, Philadelphia Pa. . . . A new Fourdrinier was installed on No. 2 paper machine by the Pusey & Jones Co. The machine was also equipped with a new lead box and inlet by the Valley Iron Works. A 48 inch Sutherland refiner was installed to increase the stock preparation capacity. . . . A boiler designed to operate at 650 PSI and using pulverized coal, was installed by the Riley Stoker Co. . . . Two new steam turbo-generators with necessary auxiliaries and switchgear were installed by Westinghouse. One of these units has a capacity of 6,000 KW and the other is rated at 4,000 KW. . . . When improvements are completed this mill will be one of the most modern of its kind and production will have been increased from 45,000 tons per year to an estimated 60,000 tons per year.



Two newsprint machines of the Southland Paper Mills. New machine at left.

Southland Paper Mills

Increase Production of Newsprint

After more than eight years of operation with the only paper machine in the South making newsprint, Southland Paper Mills started operation of its second machine in April of this year at Lufkin, Texas.

The original machine was a 235-inch Fourdrinier built by the Pusey & Jones Corp. This machine operates at a speed of about 1,300 feet per minute, producing a sheet trimming 220½ inches, at a rate of 170 tons per day.

New Paper Machine

The new Fourdrinier, built by the Bagley & Sewall Co., has a wire width of 238 inches and a trim width of 225 inches. The new machine is designed to operate at a speed of 1,600 feet per minute and produce newsprint at a rate of 190 tons per day. Changing wires on this machine is made easy by the Bagley & Sewall Simplex Fourdrinier.

The press section contains two suction presses and the drier section is equipped with 48 five-foot driers. The eight-roll calender stack is equipped with a hydraulic lifting device. A Pope type reel built by Bagley & Sewall and a Cameron Machine Co. winder and slitter complete the dry end equipment. A 7½ ton Northern crane carries the rolls from reel to winder.

The paper machine is equipped throughout with anti-friction bearings and has a Bowser lubrication system to filter and cool the oil before returning it to the bearings at the proper pressure.

The machine is also equipped with the latest type of sectional electric drive supplied by the Reliance Electric & Engineering Co.

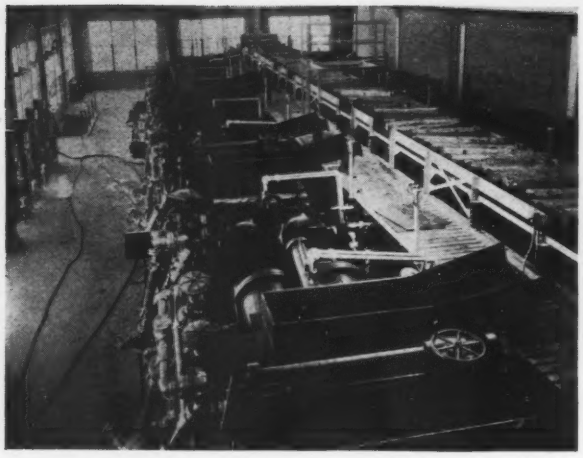
When the first paper machine was started in January of 1940, Southland made its own groundwood pulp with six Great Northern grinders but the chemical pulp was purchased from the Champion Paper & Fibre Co., at Houston, Texas. In 1941 two additional Great Northern grinders were installed, making a total of eight.

Jeffrey conveyor serves woodyard storage and barking drums.

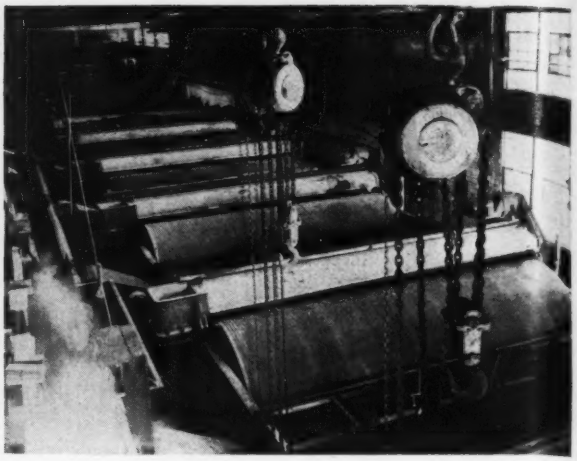
Meanwhile plans were being made

Jeffrey conveyor carrying barked pulpwood to grinders.

The chip conveyor in the sulphate mill in operation.



Some of the new Great Northern grinders.



Improved Paper Machine Co., 8x16 vacuum thickeners.

for construction of a new pulp mill for the production of unbleached and bleached Sulphate. The mill was built during the war and started operation in 1944. The production of sulphate pulp has steadily increased until it now approaches 200 tons per day.

With the addition of the new paper machine, eight new grinders were installed, making a total of 16 Great Northern grinders now in operation. The grinders are operated in pairs, each pair being equipped with a 4,000 H.P. motor making a total of 32,000 H.P. required for their operation.

The addition of these grinders made it necessary to substantially increase the power supply so two 10,000 K.W. General Electric turbo generators were installed, complete with auxiliaries and switchgear also supplied by General Electric. Two 12,000-square-foot surface condensers for these turbines were supplied by the Allis-Chalmers Mfg. Co.

The installation of the new turbines made it necessary to add new boilers to supply additional steam. Two boilers, each rated at 175,000 pounds per hour were supplied by the Combustion Engineering Co.

The new power installations supplement the existing equipment consisting of three Foster-Wheeler power boilers and two Combustion Engineering recovery boilers having a total capacity of about 200,000 pounds of steam per hour and two General Electric turbine generators, each producing 6,000 K.W. of electric power. All of the boilers and turbines are designed to operate at 600 PSI.

The total cost of this expansion project including building, equipment, etc., is approximately $9,000,000. George F. Hardy & Sons were consulting engineers and the Brown & Root Co., were the general contractors.

The following executives and supervisors are to be congratulated on the excellent job of expansion which they have accomplished: E. L. Kurth, president; R. W. Wortham, executive vice-president and general manager; K. W. Cook, secretary-treasurer; A. E. Drew, chief engineer; A. J. Crittenden, paper mill superintendent; J. J. Thompson, pulp mill superintendent; L. G. Pelkey, groundwood mill superintendent; D. C. Edmiston, power plant superintendent; J. L. McCullough, board mill superintendent, and R. E. Ferguson, master mechanic.

Equipment and Suppliers

Water Supply: Four deep well units, Layne-Texas Co.; three booster pumps, Ingersoll-Rand Co.

Groundwood Mill: Eight Great Northern grinders, Montague Mach. Co.; four 4,000 H.P. motors, General Electric Co.; five bull screens, Lufkin Foundry & Machine Co.

Stock Preparation Room: Three Cowan Fine Screens, Montague Mach. Co.; one broke Jordan and one standard Jordan, E. D. Jones & Sons; consistency regulators and proportioning equipment, Trimbey Mach. Wks.; five 8′ Dia. x 16′ vacuum thickeners, Improved Paper Mach. Corp.

Paper Machine Room: One broke beater, Valley Iron Works; paper machine hood and ventilating system, J. O. Ross Engr. Corp.; one 238″ Fourdrinier newsprint machine complete with Bowser oiling system, Bagley & Sewall Co.; Paper machine drive, Reliance Elec. & Engr. Co.; vacuum pumps, Nash Engr. Co.; dryer drainage system, Midwest-Fulton Mach. Co.; five Bird screens, Bird Mach. Co.; one roll heading machine, D. J. Murray Mfg. Co.; one Delevator, Link-Belt Co.

Turbine Room: Two 10,000 K.W. turbo-generators, General Elec. Co.; switchgear and duplex control board, General Elec. Co.; two 12,000 sq. ft. surface condensers, complete with circulating water pumps and auxiliaries, Allis-Chalmers Mfg. Co.; cooling towers, J. F. Pritchard & Co.

Boiler Room: Two 175,000 lbs. per hr. boilers, Combustion Engr. Co.; two boiler feed pumps, Ingersoll-Rand Co.; feed water regulators and combustion controls, Bailey Meter Co.; breeching, Wyatt Metal & Boiler Wks.

Woodyard: Bark furnace, Acme Brick Co.; conveyors, Jeffrey Mfg. Co.; barking drum, Fibre Making Processes, Inc.

Bleach Plant: Washers and tower equipment, Improved Paper Mach. Corp.; conveyors, Continental Gin Co.

General Equipment: Ventilating equipment, J. O. Ross Engr. Corp.; general-purpose stock and water pumps, Goulds Pumps, Inc., Warren Steam Pump Co., and Worthington Pump & Mach. Co.; general purpose motors, Reliance Elec. & Engr. Co.; controls, General Electric Co., and tile stock chests and tile linings, Stebbins Engr. & Mfg. Co.; agitators for stock chests, Improved Paper Mach. Corp.; flow meters, Appleton Mach. Wks. Republic Flow Meters Co.; liquid level and temperature recorders, Foxboro Co.; cranes, Northern Engr. Co.; transformers, General Elec. Co.

Windsor Locks Ups Output

The Windsor Locks Paper Co., Windsor Locks, Conn., has made several improvements to its mill and added some new equipment during the past few months.

This mill has one Fourdrinier machine trimming 74 inches and a three-cylinder board machine trimming 42 inches. The stock preparation equipment formerly consisted of one 1,200-pound Dilts beater, one 2,000-pound Jones beater and two E. D. Jones Jordans. To this has been added a pulper built by the American Paper Machinery & Engineering Co., and a new E. D. Jones high speed Jordan. Facilities for washing and cleaning the stock have been increased and the production of toilet tissue has been raised from 18,000 pounds to 24,000 pounds per day.

New paper machine drives, built by the Philadelphia Gear Works, have been installed on both machines. A new drum type winder has been installed on the Fourdrinier and converting equipment has been added to raise the capacity to 40,000 pounds per day. Total cost of these improvements approximates $100,000.

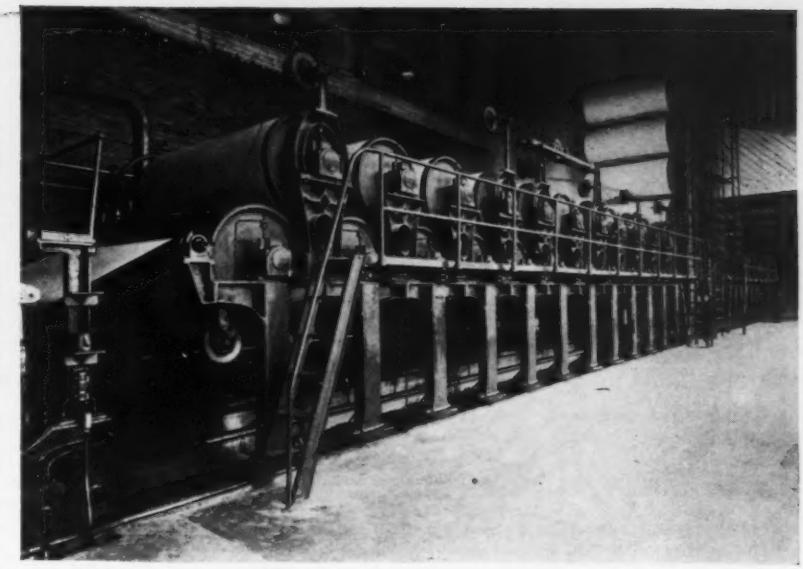
Angelus Paperbox Co. Expansion

The Angelus Paperbox Co., Los Angeles, Calif., has completely remodeled its stock preparation system and substantially improved the 108-inch, six-cylinder board machine.

Most of the new equipment was supplied by the Black-Clawson Co., Shartle Bros. Co., Dilts Machine Works and Stowe-Woodward Co. It includes the following:

Liner System — Top and Bottom Liner: One 10-foot batch hydrapulper; two six-inch DS centrifugal pumps; one No. 1 Hydrafiner; four No. 14-4 Agi-flo pumps; two No. 14 Class L agitators, including chest designs, intermixers, electrically operated rotary valves, slide valves and all necessary piping.

Filler System: A 12-foot continuous hydrapulper equipped with Dilts automatic continuous ragger, continuous junk remover, regulating box; a five-inch Class DS hydrapulper dump pump; a 100-ton Shartle grit remover; a secondary electrap; a 36-inch Classifiner; an eight-inch Disintegrator pump; a six-inch Class A white water shower pump; a 2½ Class A white water shower pump; a 36-inch x 136-inch thickener; two No. 14-5 Agi-flo pumps; a three-stack, four Jordan headbox; three No. 1 Miami Jordans, including chest designs, intermixers, motorized valves, slide valves and necessary piping; six cylinder machines; 42-inch diameter x 108-inch face molds, 18½-inch diameter R.C. couch rolls; top liner vat, overflow type, equipped with B-C Hydronamic inlet; second, third, fourth and fifth vats, counter flow type; sixth not, overflow type, equipped with Hydronamic inlet.



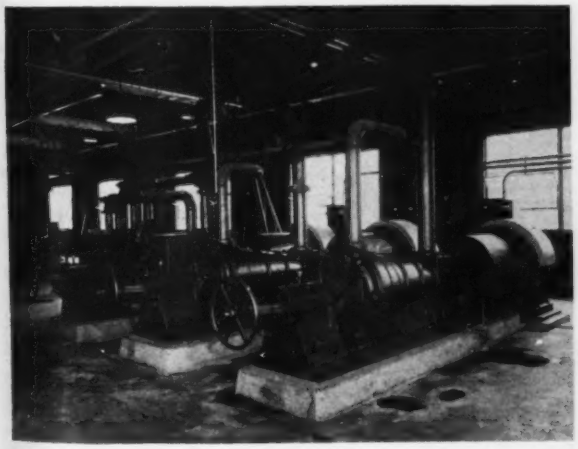
Two double-deck and one vertical sections on board machine installed at Angelus, built by Black-Clawson.

Extraction Press: 24-inch diameter extraction roll; 18½-inch diameter R.C. top roll; 24-inch diameter return drum.

Press Section: First primary — 16-inch RC bottom roll—16-inch RC top roll. Second primary—16-inch RC bottom roll—16-inch RC top roll. Third primary—18-inch RC bottom roll—18-inch RC top roll. First press—22-inch RC bottom roll—20-inch Stonite top roll. Second press — 22-inch suction bottom roll—20-inch Stonite top roll. Third press—22-inch RC bottom roll—20-inch Stonite top roll.

Dryer Section: First section (doubledeck) 23 42-inch dryers; second section (vertical) 23 42-inch dryers; third section (doubledeck) 14 42-inch dryers. Equipped with Shartle steam joints and Sheehan rope carriers. Black-Clawson spiral bevel gear drives employed throughout on presses, dryers, calenders, cutter, reel and winder.

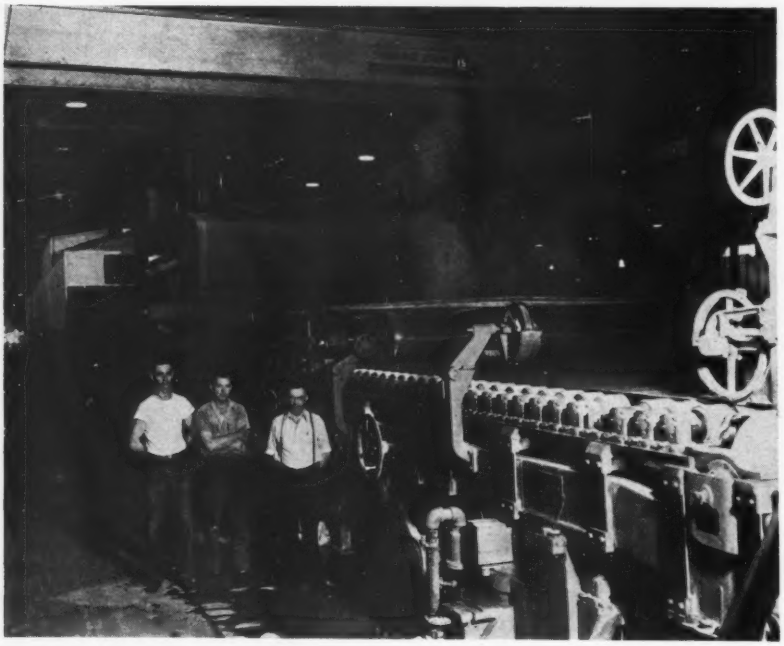
Calender Section: One five-roll and one nine-roll BC calender stacks; one BC duplex cutter; one BC two-drum upright reel; and one Cameron winder and slitter. Trim, 92 inch; grade, all grade box boards; tonnage, up to 90 tons in 24 hrs.



BELOW: Basement view of Hydrapulper system at Angelus. Batch Hydrapulper in foreground. Continuous Hydrapulper and regulator box at left.

ABOVE: Three Shartle Miami No. 1 Jordans installed at Angelus.

Standing near the winder of the new Rice-Barton paper machine are, left to right: E. F. Bearce, vice-president and production manager of the Chillicothe Paper Co.; F. L. Zellers, superintendent, and A. P. Story, president.



Operating personnel standing near Fourdrinier part of the new machine.

Chillicothe Expands

When the first paper was taken over the winder on the new No. 3 Fourdrinier paper machine, at the Chillicothe Paper Co., Chillicothe, Ohio, on March 16, the expansion program which was started almost two years ago, was brought to a successful conclusion.

The new paper machine was made by the Rice, Barton Corp. of Worcester, Mass., with a maximum trim of 164". The machine is equipped with a wire 175 inches wide by 70 feet long, has a suction couch roll, suction press roll, 22 first section dryers, size press, seven second section dryers, two calender stacks, uniform speed reel and Rice, Barton winder.

The head box and slice were supplied by the Valley Iron Works. Two No. 3A screens were supplied by the Bird Machine Co., which company also supplied a system of Dirtecs units.

The driving arrangement is a single motor connected to the center of the line shaft driving to spiral bevel gears through cone pulleys. The driving motor is 350 H.P., 250 volt, variable speed supplied with director current from a 300 Kw. motor generator set. Airflex clutches are provided between the bevel gear units and the intake shafts.

The machine is equipped with a Bowser continuous oiling system and hydraulic pressure for calenders and presses.

The machine is designed to make book, offset, writing and papeterie grades. The capacity of the mill is increased about 60 percent over the production of the older 136-inch and 156-inch machines.

For stock preparation, two 3,000-pound beaters with stainless steel tubs were supplied by the Bevis Machine Co. A 3,000 lb., breaker beater was made by the Midwest Fulton Co.

Beater and machine chests are of vitrified tile by the Kalamazoo Tank & Tile Co., and equipped with Smith agitators driven by two-speed Falk motor reducers.

Two No. 5 Miami Jordans were supplied by the Shartle Machine Co., which also supplied the pumps for the machine and beater chests.

Since the former power plant was old and did not have sufficient capacity for the additional paper machine requirements, a new boiler, and turbine generator with auxiliaries have been installed, retaining the old plant as a standby.

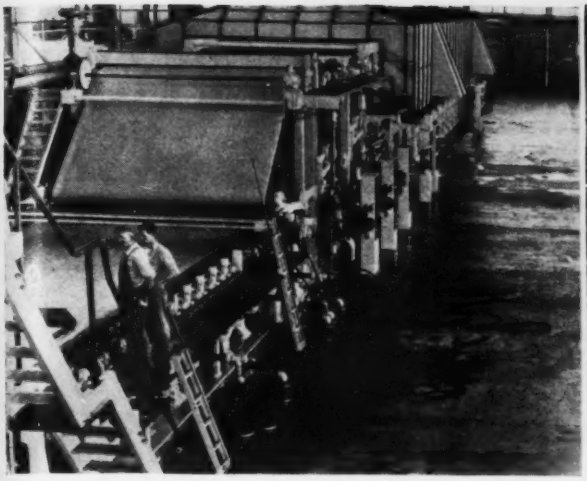
The boiler was supplied by the Riley Stoker Corp., and has 80,000 lbs. per hour capacity, operating at 615 lbs. pressure and 750 degrees superheat. The boiler is equipped with an economizer. The fuel burning equipment was supplied by Detroit Rotograte stoker.

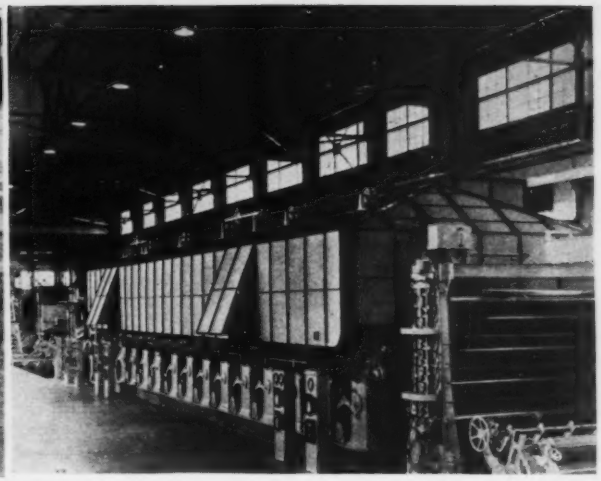
The turbine generator is a General Electric 4,000 KW operating at 4,160 volts, which is distributed to transformers for reduction to 550 volts for further distribution to load centers and Cabinetrol units.

The turbine is arranged for single extraction at 20 lbs. pressure which will be used for drying and a small amount of heating.

Included in the building program is a finishing room 97 ft. by 120 ft., two stories which are being used for converting and finishing operations.

The machine and beater rooms are designed to house not only the No. 3 machine, but a fourth machine to be installed at some future time. The





FERNSTROM PAPER MILLS IMPROVEMENTS COMPLETED

At left above is the 160-inch removable Fourdrinier paper machine installed at the Fernstrom Paper Mills, Pomona, Calif., by Black-Clawson. At right the dry end of the same machine is pictured. The new machine has a 24-inch diameter breast roll, 32-inch couch, and six section boxes. The wire is 75 feet long. . . . The press section has a 30-inch diameter suction press with 30-inch diameter RC top rolls; 30-inch diameter plain press, all pneumatic loaded; 30-inch diameter RC top roll; two felt presses and 60-inch diameter creeping dryer. . . . The dryer section, double deck-hooded, has two sections with a total of 26 60-inch paper dryers and five 60-inch felt dryers mounted in anti-friction bearings and equipped wtih Sheehan rope carriers and enclosed, individually lubricated gear train. . . . Further details: Farrell-Birmingham nine-roll calender stack, Black-Clawson uniform speed reel, Cameron rewinder. . . . Trim, 144 inches. Grades: Fruit wrap and tissue specialities. Speed—1,200 F.P.M.

space for the fourth machine and beater equipment is to be used for pulp storage temporarily. The room for the two machines is 216 ft. long by 90 ft. wide. The beater room is 128 ft. long by 90 ft. wide, with main operating floor and basement.

The heating and ventilating for these buildings were designed by the Ross Engineering Co., which also supplied the machine hood.

The power plant building, 120 ft. long by 48 ft. wide, is 80 ft. high over the coal bunker.

The buildings were designed and built by the Austin Co., of Cleveland, which built the original installation in 1920 and several additions since that time.

Officers of the Chillicothe Paper Co. are: Austin P. Story, president; E. F. Bearce, vice-president and production manager; F. L. Zellers, superintendent; McVicker, purchasing agent; and W. A. I. Cahill, sales manager; Russell A. Thomas, chief engineer.

Recent Lodding Doctor Installations

WORCESTER, Mass.—The Lodding Engineering Corp. has supplied doctors of various types to a great many paper mills through various major machine builders. The following list gives some idea of the extensive coverage of recent installations:

Through Bagley & Sewall Co.: For: Chase Bag Co., Chagrin Falls, Ohio, dryer doctors and calender doctors; Pond's Extract Co., Mechanic Falls, Maine, smooth press doctors and calender doctors; Sonoco Products Co., Hartsville, S. C., dryer doctors; Southland Paper Mills, Inc., Lufkin, Texas, Fourdrinier roll doctors, dryer doctors and calender doctors.

Through Beloit Iron Works: For: Container Corp., Fernandina, Fla., dryer doctors and calender doctors; Crown-Zellerbach Corp., Camas, Wash., size press doctors; International Paper Co., Bastrop, La., dryer doctors.

Through Black-Clawson Co.: For: Fernstrom Paper Mills, Inc., Pomona, Calif., Creping doctors; Fleming & Sons, Dallas, Texas, drying doctors and calender doctors; Peter J. Schweitzer, Inc., Spotswood, N. J., dryer doctors.

Through Downingtown Mfg. Co.: For: Sonoco Products Co., Hartsville, S. C., Fourdrinier roll doctors and press doctors; U. S. Gypsum Co., South Gate, Calif., press doctors, dryer doctors and calender doctors; U. S. Gypsum Co., Clark Township, N. J., press doctors, dryer doctors and calender doctors.

Through Moore & White Co.:. For: Austell Paperboard Co., Austell, Ga., dryer doctors and calender doctors.

Through Pusey & Jones Corp.: For: Congoleum-Nairn, Inc., Cedarhurst, Md., dryer doctors; Fibreboard Products, Inc., Fourdrinier roll doctors; P. H. Glatfelter Co., Inc., Spring Grove, Pa., Fourdrinier roll doctors; Groveton Paper Co., Inc., Groveton, N. H., Fourdrinier roll doctors and calender doctors; Paper Products Mfg. Co., Swarthmore, Pa. creping doctors; Rushmore Paper Mills, Inc., Natural Dam, N. Y., Fourdrinier roll doctors and calender doctors; St. Regis Paper Co., Tacoma, Wash., Fourdrinier roll doctors and calender doctors; Southern Advance Bag & Paper Co., Hodge, La., Fourdrinier roll doctors; Southern Paperboard Corp., Macon, Ga., Fourdrinier roll doctors and calender doctors.

Through Rice Barton Corp. For: Crown Co., Berlin, N. H., Fourdrinier roll doctors. felt roll doctors, creping doctors, dryer doctors, calender doctors and reel doctors; Oxford Paper Co., Rumford, Maine, dryer doctors.

Through Sandy Hill Iron & Brass Works. For: Golden Fleece Corp., Bancroft, Mass., creping doctors; Gotham Paper Mills, Inc., Battenville, N. Y., creping doctors; Johns-Manville Corp., Tilton, N. H., creping doctors, pick-off doctors, smooth press doctors and dryer doctors; Johns-Manville Corp., Manville, N. J., press doctors, dryer doctors, size press doctors and calender doctors; Marcalus Mfg. Co., Inc., Lincoln, N. H., Fourdrinier roll doctors, smooth press doctors, size press doctors, dryer doctors and calender doctors; American Envelope Co. (Moraine Paper Co. Division) West Carrolton, Ohio, Fourdrinier roll doctors, press doctors, dryer doctors and breaker roll doctors.

Downingtown Machine At Mutual Box Board Co. Enlarged to Eight Vats

In 1908, the Mutual Box Board Co., Inc., Utica, N. Y., purchased a five-vat, Downingtown cylinder machine, 108 inches wide. This machine has been modernized from time to time and recently Mutual ordered two new vat units complete, to be added to their present six, to give them a total of eight vats. In addition, they ordered a new set of rubber covered primary press rolls complete, 24 additional 42-inch x 102-inch face dryers and new spiral bevel gear drives for the entire machine.

When the new equipment is installed, the Mutual Box Board machine will become one of the few machines equipped with eight vats.

The six-vat machine produces about 70 tons daily of plain chip, news vat lined chip, news board, mounting chip, white vat lined, solid pulp board, jute, single and bleached manila lined, suit box board, textile winding board, sheet lining and pasting. With the new vats, press, dryers and drives, they will produce 100 tons or more.

The mill is under the supervision of the following executives: Earl W. Dunmore, president; E. W. Howell, secretary and general manager, and Chauncey E. Cole, production manager.

The following new equipment has been installed:

SHARTLE BROS. MACHINE CO., Middletown, Ohio: One 16-ft. Dilts Hydrapulper with automatic ragger and junk remover, capacity 100 tons in 24 hours; one Dilts Classifiner for filler stock from Hydrapulper; one Miami No. 2-A Jordan for the filler stock; two Dilts Hydrafiners for cycling the top and bottom liner stocks; and one stainless steel stock regulating box for Jordan distribution for four kinds of stock in beater room.

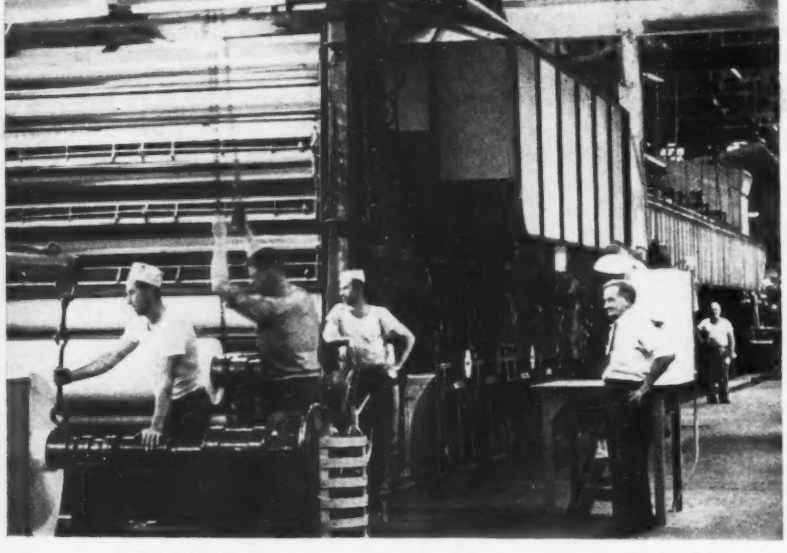
DOWNINGTOWN MFG. CO., Downingtown, Pa.: Two new vats, copper lined, and two Nofome mixing boxes, one triplex stock pump with direct connected motor drive; seven inclosed spiral bevel gear drives, including back-up drixes on calenders; 24 42-inch diameter dryers; one two-drum reel; one stainless steel stock regulating box for eight screens and four kinds of stock; four Lodding doctors for calender stock; and one set of ten-inch diameter primary rolls with housings.

In addition to the new installations shown above the following Downingtown equipment was already being used:

Nekoosa Rebuilds No. 4 Machine

A completely rebuilt and remodeled No. 4 paper machine at the Nekoosa mill of Nekoosa-Edwards Paper Company is now turning out fine printing papers of improved quality and printability. Increased drying capacity has been achieved in the main section of dryers by the installation of additional dryers. A size press has been added to the machine to permit the manufacture of surface sized fine papers. A second dryer section has been installed after the size press for the purpose of drying the paper after the tub-sizing treatment.

The calender stack at the end of No. 4 machine has been rebuilt and the overall length of the machine has been increased by approximately 60 feet. A modern ventilating hood is positioned over the new dryer section. Rope carriers are now provided for carrying the paper through the main dryer section. In addition to the above additions and improvements, a bank of 13 vortraps has been installed along the back side of the wet end of the machine for stock cleaning purposes. This installation alone is accounting for a great improvement in the cleanliness and quality of the papers produced on the machine.



Nekoosa's rebuilt and modernized No. 4 machine.

Further Plans

Drying in each section of No. 4 is now controlled by a modern moisture control unit. Additional plans for further improvement of the machine call for a new rubber covered spiral drilled suction press, a center wind drum reel, and a new winder. These improvements will be effected step by step in order not to result in a material loss of machine time. Rebuilding of the fourdrinier is also being planned.

The entire job was completed in nine working days. The machine was idle from March 21 until it commenced operation on March 30. Prior to the rebuilding operation the first section of dryers had been completely resurfaced and rebalanced.

Since No. 4 machine has been rebuilt, the range of grades that can be manufactured on the machine has been increased. Surface-sized sheets with improved printing characteristics can now be produced making the rebuilding and remodeling an important step in the Nekoosa-Edwards modernization and expansion program.

LEWELLEN MFG. CO., Columbus, Ind.: One Harvey-Lewellen caliper control.

J. O. ROSS ENGINEERING CORP., New York: One transite asbestos board panel type hood with exhaust fans to cover 80 dryers, and one vapor absorption system for three decks consisting of 80 42-inch Diameter dryers.

IMPROVED PAPER MACHINERY CORP., Nashua, N. H.: Two eight-plate screens direct connected motor drives and equipped with the cleaning mechanism.

F. G. DURKEE CO., Syracuse, N. Y.: Two new cylinder molds.

SANDUSKY FOUNDRY & MACHINE CO., Sandusky, Ohio: Two new shower pipes.

ECONOMY PUMPS INC., Hamilton, Ohio: Two new fan pumps, direct connected motors.

MIDWEST FULTON CO., Dayton, Ohio: Dryer drainage system.

The Bart J. Ruddy Construction Co., Utica, N. Y., has the contract for an extension of the machine room and shipping room, including new office. The new addition is 96 feet x 102 feet and is to be of brick, steel and concrete.

River Raisin Grows

By the end of 1948 the River Raisin Paper Co. at Monroe, Mich., will have substantially finished its $2,500,000 program of expansion. The following list shows the new equipment installed together with the suppliers:

Equipment and Suppliers

Wicks Boiler Co., 68,000 pounds per hour high pressure boiler; Westinghouse Electric Co., 7,500 KW turbine generator; Black-Clawson Co., new wet ends for paper machines Nos. 3, 4 and 5; Shartle Bros. Machine Co., 12 No. 2A Jordans; Dilts Machine Co., One 20-foot Hydrapulper; Bird Machine Co., 14 Bird screens, two Jensson screens; Emerson Mfg. Co., five No. 2 Jordans.

CHESAPEAKE PULP MILL IMPROVEMENTS

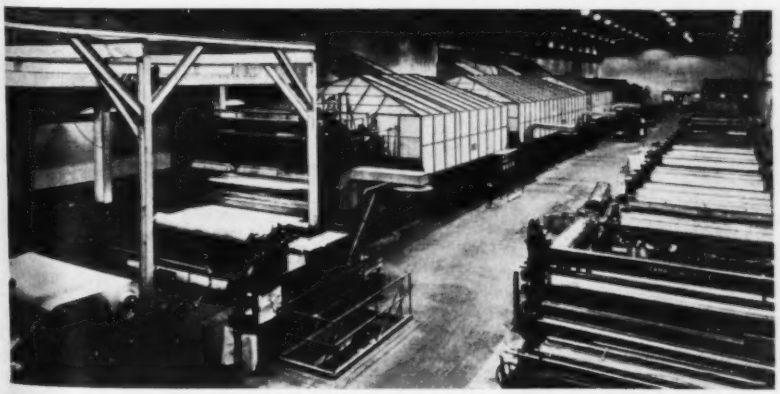
The Chesapeake Corporation, West Point, Va., has made tremendous advances in the past few years under the guidance of M. C. McDonald its president and general manager, and his staff, including J. P. Ekberg, vice-president and general superintendent; Erik Zimmerman, assistant pulp mill superintendent; Fred Kruse, paper mill superintendent; E. L. Dozier, pulp mill superintendent; Henry Vranian, chemist, and Robert Ellwanger, chief engineer. . . The following changes have been recently made: The woodroom was completely rebuilt and several Jeffrey conveyors were installed. An additional barking drum, two ten-knife chippers and new storage silos were installed. A 48-inch Sutherland disc refiner was installed to provide "hot refining" for part of the kraft pulp. Improvements were made to the screw press washing system. A Permutit boiler water softener and silica removal unit were also added. Jeffrey pulpwood conveyor with unloader in background is pictured here.

Columbia Cellulose Co., Ltd.

British Columbia coast was selected for the 30-million dollar cellulose plant of the Celanese Corp., of America because it has the timber resources and because directors of the corporation like the B.C., sustained-yield forest management policy. Watson Island, near Prince Rupert, was selected for the location of the industry because it has rail, highway and water transportation, deep-sea dock facilities within easy reach of the timber, and is only six to eight miles from the town which at present has surplus living accommodation for several thousand persons.

Two vice-presidents of the Celanese Corp., of America, George H. Richards and George Schneider, divulged this information while on a visit to B. C., on company business in connection with Columbia Cellulose Co., Ltd., a wholly-owned subsidiary. They asserted that none of the present pulp and paper plants on the coast have all the advantages of Watson Island. The availability of houses built in wartime Rupert will make it unnecessary to establish a town in connection with the new industry which will employ about 400 in the plant and some 600 in the woods.

Start of construction at the site will depend on when steel deliveries can be arranged. It will either be this fall or next spring, but in any case will be in time to synchronize with arrival of steel and other major items, some of which require 18 months for delivery. The site has been prepared and arrangements made for construction. Plans call for being ready for operation by the latter part of 1950.



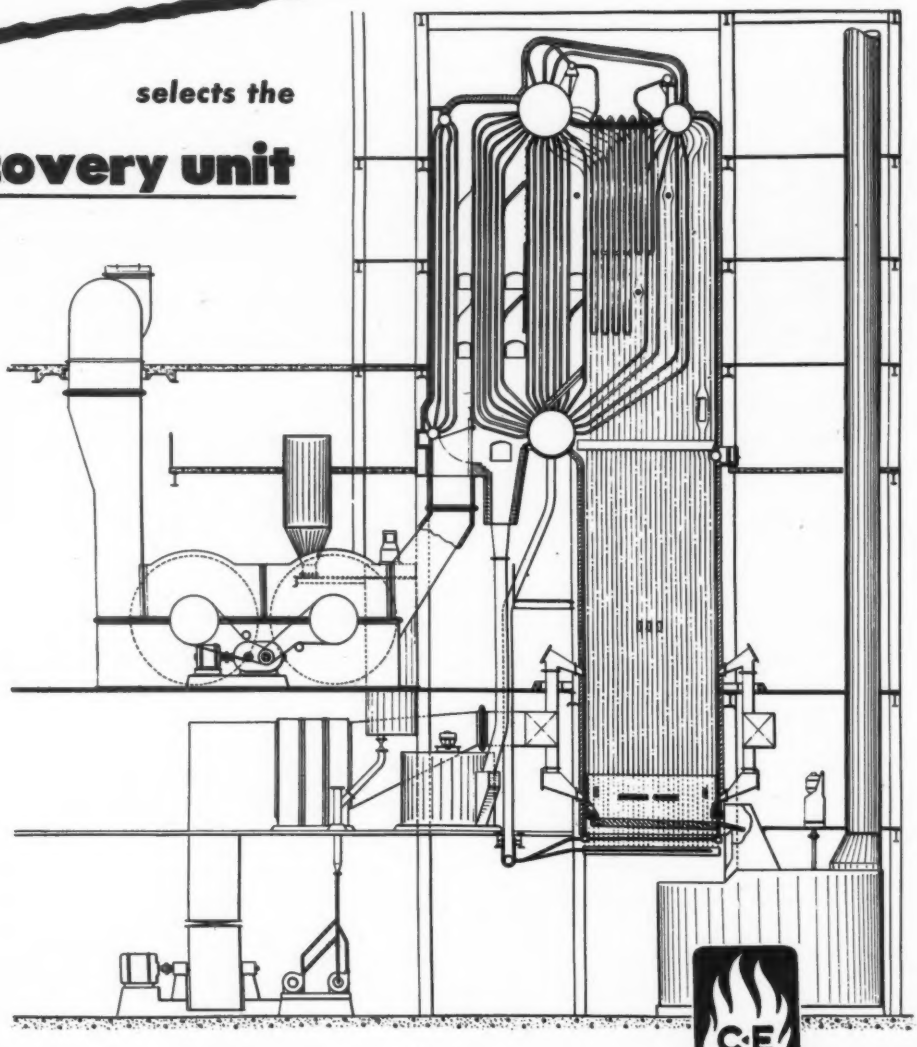
"NAME BIG SWEDE'S TWIN" CONTEST

The Rhinelander Paper Co., for the past few months has sponsored a contest to find a name for its new paper machine. The new Fourdrinier, (right) which will start operation this Fall, is a companion to the "Big Swede" (left) which has been producing glassine for several years.

COOSA RIVER NEWSPRINT COMPANY

selects the

C-E recovery unit



A C-E Recovery Unit, cross-sectional elevation of which is shown above, was recently purchased by the Coosa River Newsprint Company for their new mill at Childersburg, Alabama.

This unit is designed to burn 750,000 pounds of black liquor solids per 24 hours and will produce steam at 590 psi and 730 F.

The C-E Recovery Unit's reputation for efficiency, reliability and operating economy is built on a sound basic design enhanced over the years by the addition of carefully developed improvements. The Coosa River unit will incorporate these many service-proved advantages. B-233

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C-E PRODUCTS FOR the paper industry include steam generating, fuel burning and related equipment; also many types of pressure vessels.

They Liked "The Progress of Paper"

Dear Mr. Lockwood:

Your book, "The Progress of Paper," was received this morning. I spent quite some time going through it and must say it is an outstanding piece of work. It is a valuable history on the paper industry with thousands of facts and figures of interest to anyone connected with the business.

Your issuance of this fine book upon your 75th Anniversary will long be remembered. We wish to extend our congratulations and trust that you may continue to grow and serve as you have during the many years now past.

C. L. PETERSON
Advertising Manager
Cleveland Crane & Engineering Co.
Wickliffe, Ohio

Dear Mr. Lockwood:

I have just received the very handsomely bound copy of "The Progress of Paper."

Please accept my congratulations on the splendid job which you have done in assembling and presenting the interesting material for this edition, and many thanks for your thoughtfulness in sending me a copy.

G. N. CARLETON
President
Detroit Sulphite Pulp & Paper Co.
Detroit, Mich.

Gentlemen:

I have received your 75th Anniversary copy of "The Progress of Paper" and your 75th Anniversary.

I have not had time to thoroughly go over it as yet, but am sure I am going to enjoy it very much. I have seen 65 years of it myself.

F. C. BOYCE
President
D. J. Murray Manufacturing Co.
Wausau, Wis.

Gentlemen:

We want to thank you very much for sending us your very well gotten up book titled "The Progress of Paper."

This book will be very useful to us from time to time, and we will be glad, indeed, to have it in our library.

Please permit us to compliment you on the excellent job you have done on this publication.

O. A. WALES
Vice-President
Cellulose Sales Co., Inc.
New York, N. Y.

Gentlemen:

We are pleased to acknowledge receipt of our embossed copy of "The Progress of Paper," which is certainly a most complete history of paper-making over the past 75 years. We hope we may find many uses for this excellent edition for which you are to be congratulated.

C. B. COOK
Vice-President
Elwell-Parker Electric Co.
Cleveland, Ohio

Gentlemen:

Many thanks for thoughtfully sending me the cloth bound copy of "The Progress of Paper," which is from your Seventy-Fifth Anniversary Number.

Needless to say, this will prove to be a very valuable addition to our library.

HENRY D. SCHMIDT
President
Schmidt & Ault Paper Co.
York, Pa.

Dear Mr. Lockwood:

I am delighted by the receipt of a copy of "The Progress of Paper," issued by your Company. It is a remarkable piece of work, which I shall read —and study—with interest and profit.

What a task it must have been to get cut such a big piece of work.

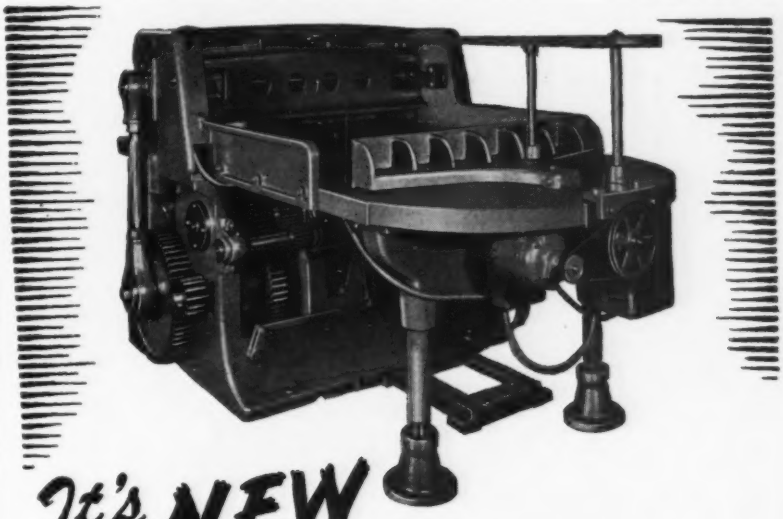
F. G. COBURN
Brown Co.
New York, N. Y.

Dear Mr. Lockwood:

I am pleased to acknowledge with thanks your courtesy in sending me a copy of the very handsome and most interesting book, "The Progress of Paper," which you have brought out in celebration of the seventy-five years during which the PAPER TRADE JOURNAL has served the industry.

I have read this book with great interest and assure you that I will be very happy to make it a part of my personal library. Hearty congratulations to you and to your associates on your own seventy-five years of progress and thanks again for including me among those to receive this very interesting volume.

R. W. HOOKER
Vice-President & Sales Mgr.
Hooker Electrochemical Co.
Niagara Falls, N. Y.



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A NEWLY designed Undercut Trimmer retaining the outstanding features of the Smith & Winchester Standard Undercut with many new features, for fast, safe, accurate, more convenient operation. Features include: Heavy one-piece base frame; hinged front table to take away stock from cutter after cut; knife, to cut stock, raises from below the table; anti-friction bearings on drive shaft; disc type friction clutch; back gauge operated by variable speed, reversible motor for close setting; push button controls; illuminated index tape.

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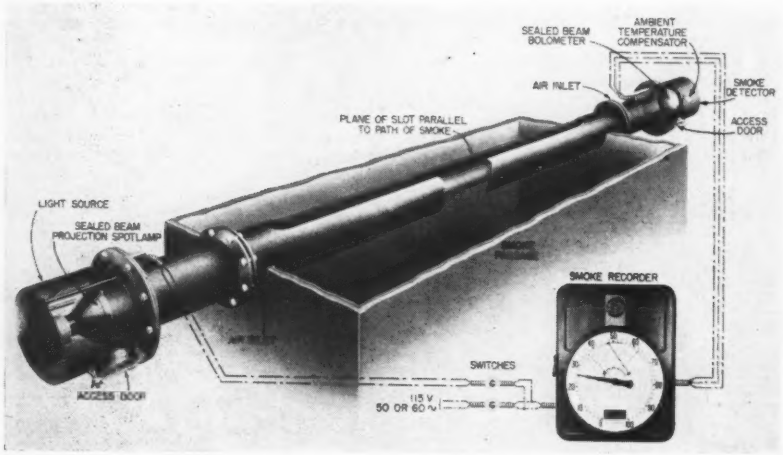
EQUIPMENT AND SUPPLIES



Smoke Density Recorder

The electronically-operated Smoke Density Recorder is designed to measure and record density of smoke or dust in flues or ducts. The bolometer principle is that used by astronomers for measuring the radiation from stars. The amount of radiation reaching the filament is dependent upon the density of smoke or dust, and the temperature of filament dependent on the amount of radiation reaching it. Filament temperature is measured by electronic recorder in terms of smoke density. Instrument consists of standard Bailey Electronic Recorder, bolometer-type smoke detector and sealed-beam light source, the two latter units comprising the primary element. Bolometer and light source are installed on opposite sides of smoke passage so that beam from light source is directed at the tungsten filament of the bolometer. To insure proper alignment, they are mounted on opposite ends of a 4-inch pipe extending across the entire width of smoke passage, the pipe being slotted to insure free passage of smoke into the radiated beam from light source. Temperature compensating circuit is designed to eliminate errors due to high ambient temperatures and to be unaffected by normal voltage variations. Voltage drop across bolometer filament is balanced against voltage drop across a motor-driven slidewire unit in recorder casing. When temperature of filament changes, the potentiometer becomes unbalanced and slidewire unit is automatically repositioned to restore the balance. Recording pen is directly connected to slidewire unit and is correspondingly repositioned. Measuring circuit may be equipped with switches to actuate signals or alarms when the smoke density reaches a predetermined maximum value, or with control to turn on automatically over-fire air jets. For details and prices write to Bailey Meter Co., 1050 Ivan road, Cleveland 10, Ohio.

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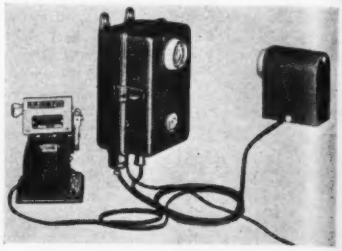
Photo-Electric Counter

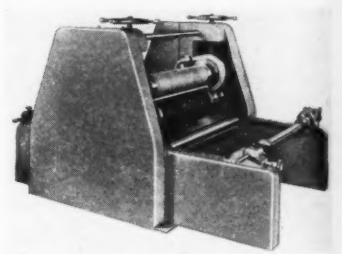
Photo-Electric Counter, Type 20AP5, is described as a general purpose unit for installation on any conveyor system or automatic machine for selective counting by height and length. Light source supplied has adjustable lens system which permits narrowing down the light beam for counting small objects. Comes packaged complete including light source, photo-electric control and electric counter. Simplicity of installation is featured. Light source and electric counter are supplied with



cords and plugs which attach to photo-electric control. This has a line cord for plugging into any lighting circuit. Entire counter can thus be installed quickly without the help of an electrician. The unit is said to present the ultimate in flexibility. The same counter and installation is designed to count light or heavy objects, bottles or cases. One or more electric counters — containing the counting face and reset — may be located anywhere in the plant remote from location where count is being made. Specification legend: speed of operation, to 600 counts per minute; operating range, 6 feet between photo-electric unit and light source; maximum number of counts before returning to zero, 99,999 (counter resets to zero by turning knob); plugs into 115-v. 60 c., a.c. standard light outlet. For details and prices write to Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.

Mono-Block Embosser

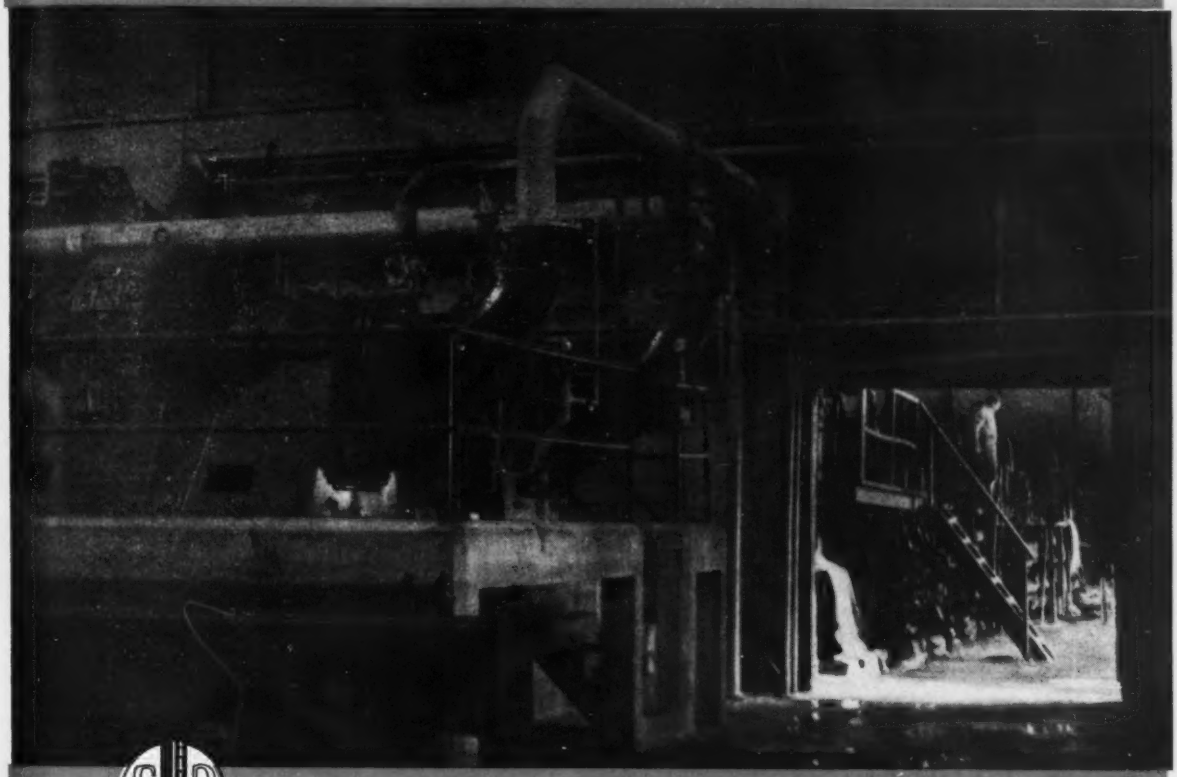
The Mono-Block Embosser, developed for the paper, foil, plastics, graphic arts and leather fields, is announced as a new design featuring mono-block construction, quicker roll changes, silent drive, accessibility and



prewar price range. Mono-block construction of frame is designed to produce a single, rigid steel unit many times sturdier than the conventional cast-iron one, to eliminate interfering tie rods, and to produce a low, compact, accessible unit. Housing for the embossing roll carries the bearings, lubrication oil seals and space sleeves in a self-contained unit which permits rapid roll change. Bearings are heavy duty, self-aligning, roller type. Conventional driveshaft is replaced by a

Problem

You have just so much power and no more, yet you want more stock for your paper machine in order to get it up to the full capacity made necessary by rising costs.



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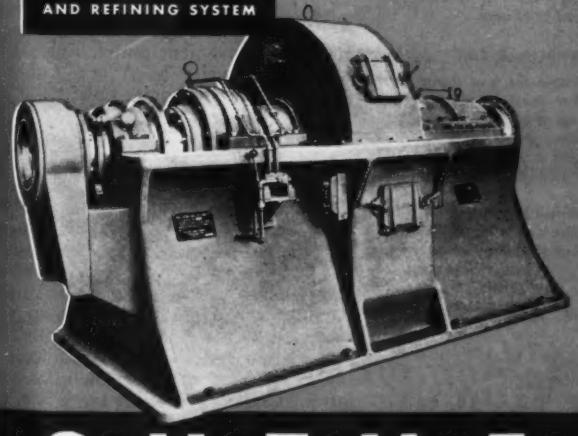
Solution

Use your available power more efficiently with Sutherlands. You'll get more stock per H. P. and better stock, too. You'll be amazed at what your paper machine can do, when you give it all the "stuff" it can take. Illustration shows two of four Sutherlands behind one paper machine.



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SUTHERLAND REFINER CORPORATION

TRENTON, NEW JERSEY — *Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin*

Sutherland Refiner Limited, 319 Drummond Building, Montreal, P. Q.

SUTHERLAND

direct V-belt drive to the rewind and embossing head. Silent gearing arrangement transmits the power to rolls, eliminates noise, vibration and torque difficulties. Two models are available, straight screw pressure control and a hydraulic control model. Both are available in 32, 42 and 52 inch sizes. Straight screw pressure control 32 and 42 inch sizes are designed for operation with a 5 hp Reeves gear head Moto-drive or equivalent. The 52-inch requires 7½ hp. Hydraulic pressure 32 and 42 inch models require 7½ hp, the 52-inch takes 10 hp. Motor drives and controls are not included but can be supplied. Machine will accommodate embossing rolls of 2 to 1 ratio, bored or solid steel rolls from six to eight inches diameter, and paper rolls 12 to 16 inches diameter. Manufacturer states that any weight of paper from tissue and glassine to board stock will be accepted by the embosser at speeds to 300 feet per minute, that unwind and rewind stands can accommodate rolls of material to 40 inches diameter. Inking attachment consisting of a rubber-inking roll and a screen fountain roll with doctor blade and color is a compact anti-friction bearing unit. It is available at extra cost. Pictured is the standard model Mono-Block Embosser equipped with straight screw pressure control manually applied. Write Hobbs Mfg. Co., Worcester, Mass.

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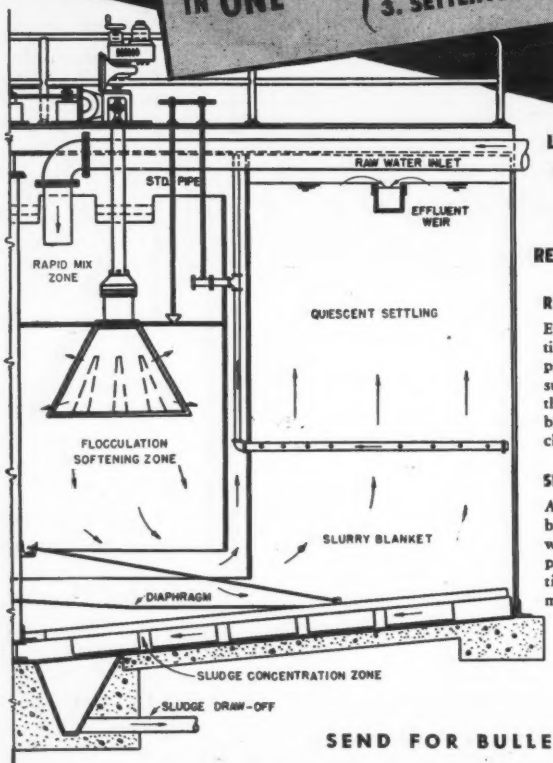
COMBINES IN ONE UNIT { 1. RAPID MIX 2. FLOCCULATION 3. SETTLING



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Exact control of recirculation of lime sludge and partially treated water insures several passages of the water through slurry blanket before it is discharged as effluent.

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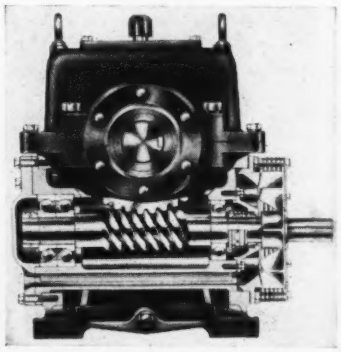
Enclosed Worm Gear Drive

Hypower Enclosed Worm Gear Drives are presented in horizontal and vertical types smaller in size than conventional drives of equal capacity, designed to deliver power at lower cost. Because of high thermal capacity, they



are said to permit the use of a smaller, less expensive reducer. Features include: increased low carrying capacity; increased thermal capacity—due to the immersion in the oil reservoir of an air channel cylinder through which passes a high velocity stream of cool air; reduction in size and weight; improved mechanical capacity. Available in single and double worm gear reductions in a wide range of standard ratios. For prices and details write to Foote Bros. Gear & Machine Corp., 4545 South Western blvd., Chicago.

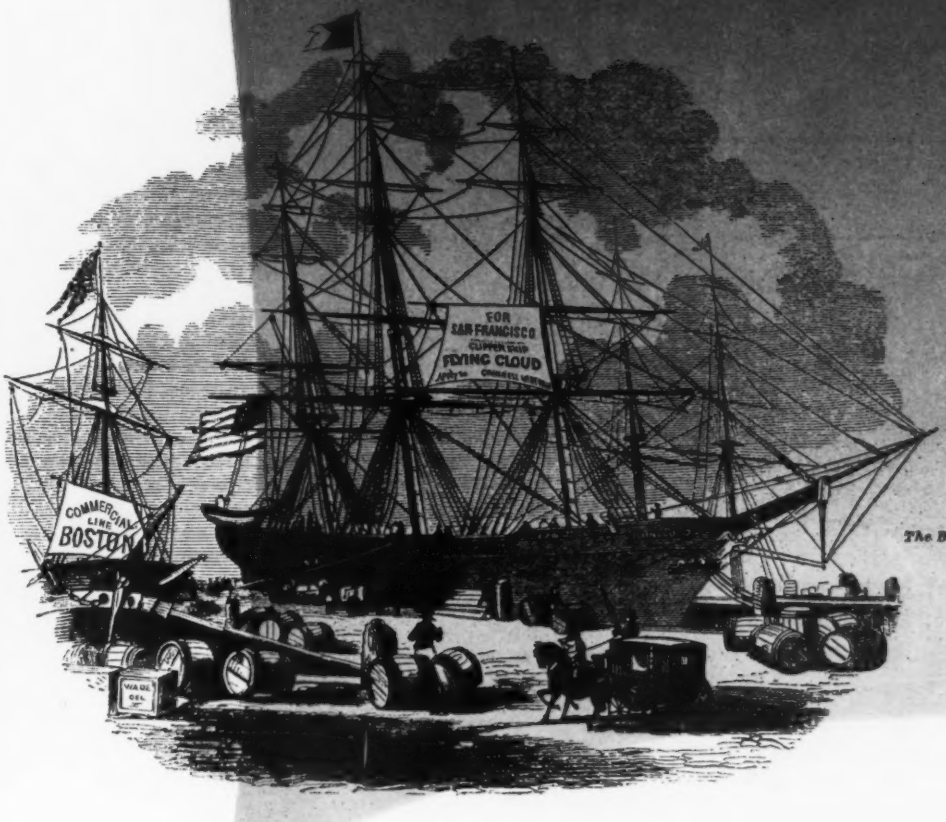
Label Dispenser

Kum-Kleen Label Dispenser is described as a portable, automatic, electric unit which makes possible production-line labeling speed by delivering quickly and automatically to the operator individual self-adhesive labels ready for application. Patented self-threading mechanism permits rapid changeover of labels and loading without use of spools, reels or cores. Constant speeds of delivery are set by a simple rheostat dial adjustment or intermittent operation produced by use of a dual control foot switch. Operates on either ac or dc and may be plugged into any convenient outlet. For details and prices write to Avery Adhesive Label Corp., Monrovia, Calif.

N-Sol-A Water Purifier

N-Sol-A Process for the purification of raw water is covered by U.S. Patent 2,444,774 granted to Harold R. Hay and assigned to Philadelphia Quartz Company. Patent covers the process of preparing activated silica sol which has been formed by reaction with ammonium sulfate or other salts of ammonia and dilute sodium silicate. This sol used in conjunction with a coagulant such as alum or iron salts produces rapid formation of large floc, resulting in the removal of a greater percentage of impurities from the raw water. For details write to Philadelphia Quartz Co., Public Ledger bldg., Philadelphia 6, Pa.

One first leads to another...



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LITERATURE

Newsprint Service Bureau, 342 Madison avenue, New York 17, N. Y. Book, "Newsprint Paper Machine Operation," by W. G. MacNaughton. A condensation of the author's experience in the North American paper industry, reinforced by reports upon features of Fourdrinier operation by many technical and practical paper industry men. Price $4 postpaid.

Northern Equipment Co., Erie, Pa. Bulletin, No. 485, "Boiler Water Level Control," Scoville Mfg. Co., Waterbury, Conn.

H. G. Weber & Co., Inc., Kiel, Wis. Booklet, "Weber Paper Bag Machines." General information about the firm's line of machines.

Everlasting Valve Co., 49 Fisk street, Jersey City 5, N.J. Bulletin, No. E-120, "Everlasting Valves for Boiler Blow-Off." Presents in tabular form the different types of valves for blow-off service so that correct selection can be made for pressure, method of operation, operation conditions and A.S.M.E. code requirements. Complete dimensions included with full illustrations.

Champion Paper & Fibre Co., Hamilton, Ohio. Booklet, "Company Annual Reports," by K. C. Pratt. Third volume of "The Stet Library of Editorial Aids." Chapters include History and Purpose, Stockholder Report, Report to Employees, Special Reports, etc.

Rutgers University Press, Book, "Print Paper Pendulum, Group Pressures and the Price of Newsprint," by L. Ethan Ellis.

Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill. Bulletin, No. 483, "Taylor Forge Stainless." Provides an economical approach to flanged piping. Includes drawings, dimensions and prices of fittings and flanges available in stainless steels and other materials.

Associated Valve & Engineering Co., 1150 West Marquette road, Chicago 21, Ill. Bulletin, "Valves for the Chemical Industry." Describes stainless steel safety and relief valves.

Red-Ray Mfg. Co., Inc., 455 West 45th street, New York 19, N.Y. Bulletin, No. 16, "Red-Ray Radiant Gas Burners in Paper Mills."

Timber Engineering Co., 1319 Eighteenth street, N.W., Washington 6, D.C. Brochure, "For Users of Wood and Forest Products." Outlines available technical services, also covers timber engineering and designing, timber and forest products research, product development and wood chemistry.

Armstrong Machine Works, Three Rivers, Mich. Bulletin, No. 187, "Individual Dryer Temperature Control for Paper Machines." Describes operation of the control by means of text and schematic diagrams.

Towmotor Corp., 1226 E. 152nd street, Cleveland 10, Ohio. Bulletin, "Operator's Guide." Instructions for operation of a fork lift truck. Includes sections on accessories and their operation, suggestions for handling materials and containers of many types, and a section on load-handling techniques.

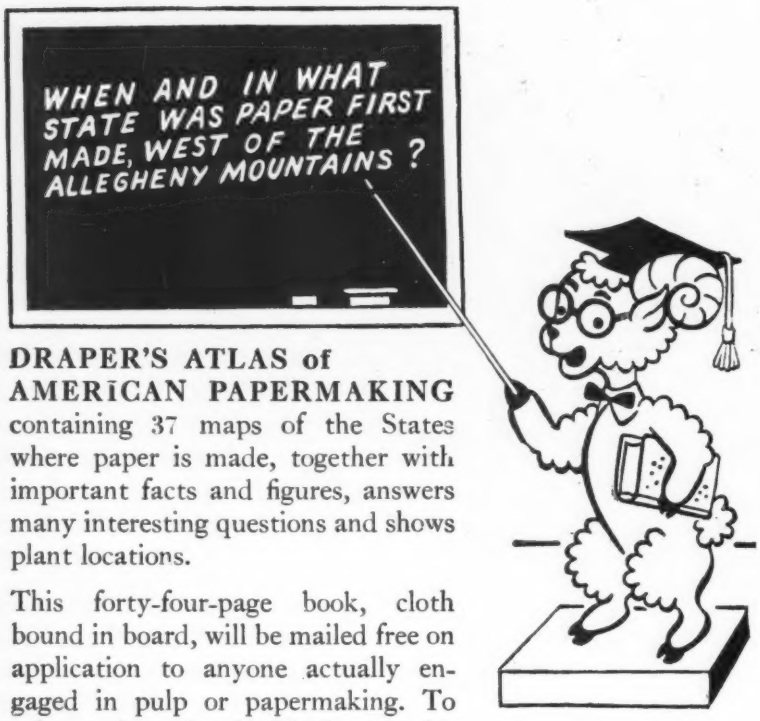
Eriez Mfg. Co., Erie, Pa. Catalog, "Non-Electric Permanent Magnetic Separators." Specifications of weights and sizes and strength comparisons for various types of plate magnets, also tables of operating capacities for permanent magnetic pulleys, drums, pneumatic line assemblies and pipeline traps. Engineering service and laboratory facilities offered by the company also are enumerated.

Ross Heater & Mfg. Co., Inc., 1407 West avenue, Buffalo 13, N. Y. Bulletin, "Shell and Tube Heat Exchangers and Allied Equipment." Illustrations of major items, supplemented by cutaways and interior views, accompany brief descriptions of design, construction and uses.

General Electric Co., Apparatus Dept., Schenectady 5, N.Y. Bulletin, "45-Ton Diesel-Electric for Industrial Switching."

Swenson Evaporator Co., Harvey, Ill. Bulletin, E-108, "Recovery Equipment for Pulp Mills". Explains application of Swenson products to recovery problems of pulp mills. Contains flow sheets and photographs of installations.

What do you know about Paper?



DRAPER'S ATLAS of AMERICAN PAPERMAKING containing 37 maps of the States where paper is made, together with important facts and figures, answers many interesting questions and shows plant locations.

This forty-four-page book, cloth bound in board, will be mailed free on application to anyone actually engaged in pulp or papermaking. To others, the price is $2.00 postpaid, while the edition lasts.

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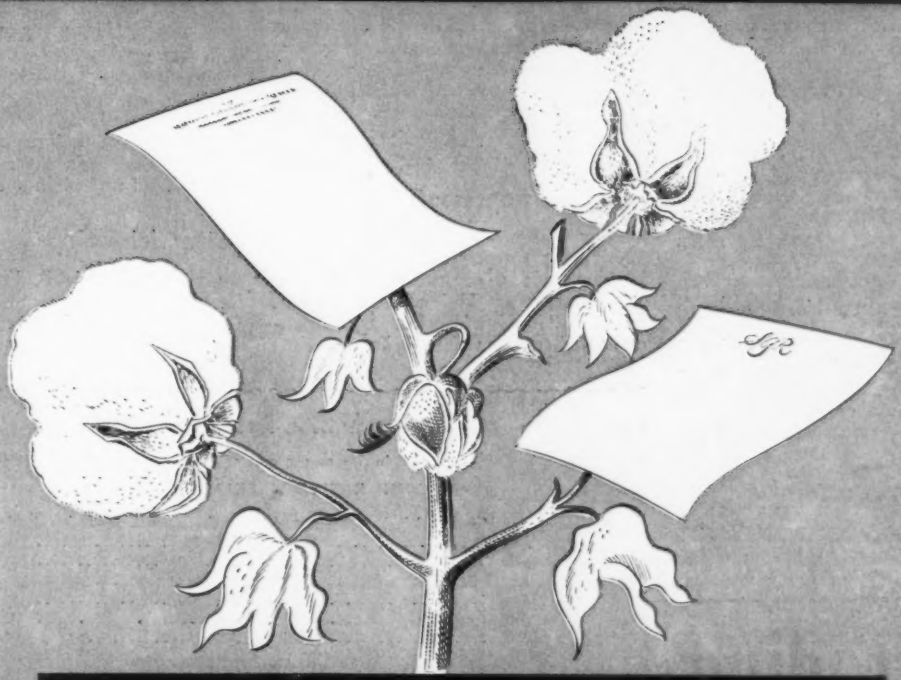
Answer to Question No. 9 In 1793 in Kentucky.

in high quality paper the trend is to



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Good usable cotton rags for papermaking are getting scarcer, more costly every day. But papermakers do not have to accept less satisfactory substitutes. Hercules Bleached Cotton Linters are rapidly gaining acceptance as high quality extenders for rags. Their performance in rag-content writing papers, for example, is well known. Their clean virgin fibers contribute good color, permanence, feel, bulk, opacity, and sheet structure to the paper. Write for helpful technical information on adapting Hercules Bleached Cotton Linters to your paper processing.

HERCULES

SIZING MATERIALS AND CHEMICALS FOR PAPER

HERCULES POWDER COMPANY

962 King Street, Wilmington 99, Delaware

Chemical Associates Meeting

MILWAUKEE — The second annual meeting, since their formation, was held by the principals of Benlo Chemicals of this city; Eastern Chemicals, Inc., Albany, N. Y., and Southern States Chemical Co., Atlanta, at Sunrise Lodge, Land-O-Lakes, Wis., during the week of July 11. These organizations came into being when, in 1944, they took over and marketed a certain portion of the chemical products formerly distributed through the Industrial Chemical division of the Hercules Powder Company. Their operations, within their respective areas are over a total of 19 States.

Attending the meeting were L. B. Greiner, D. L. Hurley, and B. M. Slicting of Benlo Chemicals; H. C. Dorr and J. R. Nolan of Eastern Chemicals, Inc.; and S. K. Davis, J. R. Porter and H. M. Thompson of the Southern States Chemical Co.

Brown Leaves Sprout & Waldron

MUNCY, Pa.—J. D. Brown resigned as manager of the pulp and paper division of the Sprout & Waldron Co., manufacturing engineers, on August 31. His plans for the future have not been disclosed.

Nash Gets Ajax Line

LOS ANGELES—The A. W. Nash Co., 5225 Wilshire boulevard, has been appointed Southern California representative of the Ajax Flexible Coupling Co., Inc., of Westfield, N.Y., and is taking over the Ajax account from Howard Speddy who is retiring from business after a long career in handling Ajax and other industrial products throughout the Pacific States.

Forms Ben P. Steele Co.

NEW YORK—The Ben P. Steele Co., has been organized by Ben P. Steele, until recently in charge of the export department of the Pennsalt Mfg. Co., New York office. The new firm, which is at 62 William street, will feature industrial and agricultural chemicals and insecticides for export and domestic sale. Telephone is WHitehall 3-0370.

Chemical Represents Union

NEW YORK — Chemical Pump & Equipment Corp. has been appointed to represent the Process Equipment Department of Union Iron Works, Erie, Pa., in New York east of Rochester and western Connecticut.

Oliver's Runyon to Hazleton

HAZLETON, Pa.—Russell Runyon took over the purchasing for the local plant of Oliver United Filters, Inc., on September 1, succeeding Ren. W. Martin, resigned. Mr. Runyon previously was with the firm's Oakland, Calif., purchasing department since 1936, where G. I. Williams, Jr., is purchasing agent.

Eames to Smith & Lane

BOSTON — Smith & Lane Co., 665 Atlantic avenue, is now represented by Herman Eames, who is calling on the trade in the New England territory. The company is a manufacturer's agent for paper and cellophane specialties, paper board, transparent containers, and printed and plain specialty bags.

Potter Joins Lipp

CHICAGO — Dale B. Potter has been appointed general sales manager of the J. J. Lipp Paper Co. He was formerly with National Container Corp.

up-grading

"Virginia" Zinc Hydrosulphite (ZnS_2O_4) is made expressly for the pulp and paper industry as a reducing, brightening, and decolorizing reagent for ground wood pulp, folding cover, and de-inked stock. You may realize better prices for up-graded products resulting from the brightening properties of this fine ZnS_2O_4. "Virginia" Zinc Hydrosulphite is the only *high-test*, 85-86 percent pure ZnS_2O_4 on the market. Shipped in 250-pound, single-trip steel drums.

•

For descriptive literature on "Virginia" Zinc Hydrosulphite, write Virginia Smelting Company, West Norfolk 3, Virginia.

VIRGINIA *Zinc Hydrosulphite*

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1948		Corresponding Weeks—1947	
July 24	103.1	July 26	106.1
July 31	96.5	Aug. 2	103.9
Aug. 7	97.0	Aug. 9	105.1
Aug. 14	96.1	Aug. 16	104.8
Aug. 21 (Revised)	97.7	Aug. 23	103.7
Aug. 28	**96.5	Aug. 30	104.1

COMPARATIVE MONTHLY SUMMARIES

1947						1948	
Jan.	102.1	May	106.2	Oct.	109.5	Jan.	100.3
Feb.	105.9	June	106.2	Nov.	109.3	Feb.	99.8
Mar.	106.1	July	93.5	Dec.	101.5	Mar.	100.8
Apr.	105.1	Aug.	104.2			Apr.	100.8
		Sept.	102.0	Year Avg.	104.3	May	100.5
						June	‡94.5
						July	‡88.1
						Aug.	‡96.8

‡ Preliminary Ratios.

COMPARATIVE YEARLY SUMMARIES

	1941	1942	1943	1944	1945	1946	1947	1948
Year to Date	94.2	93.2	88.2	87.9	88.0	100.1	103.6	97.5
Year Average	97.4	90.4	87.8	88.1	89.4	101.1	104.3	

** Indicates 1948 volume of 172,533 tons—Comparable Week 1947—165,106 tons.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1948		Corresponding Weeks—1947	
July 24	91	July 26	99
July 31	92	Aug. 2	99
Aug. 7	90	Aug. 9	97
Aug. 14	93	Aug. 16	100
Aug. 21	93	Aug. 23	100
Aug. 28	93	Aug. 30	99

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1947	99	103	101	100	101	101	90	99	96	101	99	89	98
1948	99	100	102	102	100	94	81	99					

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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FROM CYANAMID

Re: Wider Markets for Paper...

New PAREZ Resin 611 Imparts Water Resistance To Starch-Pigment Paper Coatings

The desire for improved wet-rub resistance in starch-pigment paper coatings has been met by Cyanamid's new PAREZ Resin 611, a melamine-formaldehyde resin which, to date, has given exceptional results in extensive commercial field runs.

This dry white powder may readily be incorporated into the paper coating by any one of several methods including the addition of the dry resin to the starch before or after cooking, and the addition in water solution to the finished coating color.

Some of the significant advantages of PAREZ Resin 611 are:

- Good solubility or dispersibility
- Fewer viscosity problems
- Smooth uncalendered coatings
- Formaldehyde fumes greatly reduced
- High wet-rub efficiency at low resin content
- Brightness of coated paper is appreciably better than that of untreated sheets
- Good aging stability of wet-rub resistance of coatings
- Easy to handle, excellent storage stability

PAREZ Resin 611 is the result of persistent Cyanamid research which is constantly seeking to improve the quality of paper, thereby opening up new markets to the paper-maker. PAREZ† Resin 607, the melamine resin that imparts wet strength to paper, is another of the many chemicals developed for this purpose.

For full information on PAREZ Resin 611, send for Technical Bulletin No. 19.

Test shown above illustrates wet-rub resistance of starch-pigment coating treated with PAREZ Resin 611. Note how coating on bottom sheet, to which resin has been added, remains rub-proof, while untreated coating on upper sheet rubs off.

ALWAX* Sizes • WAXINE* Sizes • Rosin Size • PAREZ* Resins Synthetic Resins • Casein • Alum • Sulfonated Oils • Fillers Defoamers • Soda Ash • Caustic Soda • Salt Cake • Acids • Clays AEROSOL* Wetting Agents • CAL MICRO** (Calcium Carbonate) and other Paper Chemicals. For low-cost chemical equivalent of distilled H_2O . . . FILT-R-STIL* Demineralizing Units. *Reg. U. S. Pat. Off. **Trade-mark

†Trade-mark of American Cyanamid Company covering its synthetic resins for use by the paper industry. The process under which PAREZ is applied in the production of wet-strength paper are covered by U. S. Patents Nos. 2,291,079, 2,291,080 and 2,345,543 and U. S. Patent Application Serial No. 453,032.

American Cyanamid Company
Industrial Chemicals Division
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

SALES OFFICES: Boston, Mass.; Philadelphia, Pa.; Pittsburgh, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Cincinnati, Ohio; Chicago, Illinois; Detroit, Mich.; Kalamazoo, Mich.; St. Louis, Missouri; Los Angeles, Calif.; San Francisco, Calif.; Seattle, Washington In Canada: Dillons Chemical Co. Ltd., Montreal and Toronto

SECTION OF THE

TECHNICAL ASSOCIATION
OF THE PULP AND PAPER INDUSTRY

122 E. 42nd ST., NEW YORK 17, N. Y. *Edited By* R. G. MACDONALD, *Secretary*

Mechanical Pulping Conference
Poland Spring, Maine, Sept. 27–29, 1948

The Technical Association will hold its first Mechanical Pulping Conference at the Poland Spring House, Poland Spring, Maine, on September 27-29, 1948.

This meeting is being cosponsored by the Technical Section, Canadian Pulp and Paper Association. John L. Parsons of the Hollingsworth & Whitney Company is the general chairman. His technical program committee consists of R. M. Drummond, International Paper Company, A. E. Bachmann, Missiquoi Corporation, and H. J. Perry, Frederic C. Clark Associates, representing TAPPI and G. F. Witty, Canada Paper Company, W. W. Holland, Quebec North Shore Paper Company, and G. E. Shipman, Donnaconna Paper Company, representing the C.P.P.A.

This meeting is, in a sense, a memorial to the late Worthen E. Brawn, past president of TAPPI who initiated it and planned to devote much time to its preparation.

Reservations should be made directly with the Poland Spring House, Poland Spring, Maine. Anyone desiring transportation from Portland, Maine should notify the hotel when the reservation is made. The railroad station for Poland Spring is Danville Junction on the Maine Central Railroad, north of Portland. Trains to Danville Junction operate infrequently on Sunday, September 26.

TENTATIVE PROGRAM

Monday, September 27, 1948

Wood, Its Preparation and Measurement, by J. B. Jones, The Ontario Paper Co., Ltd.

Manufacture of Groundwood for Newsprint, by W. W. Holland, Quebec North Shore Paper Co.

Use of the Roberts Grinder for Manufacturing different Grades of Groundwood, by Robert Magruder, St. Regis Paper Co.

Use of pocket Grinders for Manufacturing Different Grades of Groundwood, By C. I. Gehring, Oswego Falls Corp.

Instrumentation in Groundwood Manufacturing, by J. N. Franklin, Bowaters Newfoundland Pulp and Paper Mills, Ltd.

Dinner and Entertainment, "Maine-N. H. Night."

Tuesday, September 28, 1948

Screening and Thickening Operations, and White Water Systems, by J. Edwards, Price Brothers and Co., Ltd.

Refining of Rejects, by C. T. Robinson, Consolidated Paper Corporation, Ltd.

Grinding Room Operation and Its Relation to Paper Quality and Products, by R. T. Wetmore and L. W. Dunphy, Anglo-Newfoundland Development Co.

Bleaching of Groundwood with Hydrosulphite.

Bleaching Groundwood Pulps with Hypochlorite, by F. A. Simmonds, U. S. Forest Products Laboratory.

Peroxide Bleaching of Groundwood—Recent Developments and Commercial Status, by J. S. Reichert and Robert H. Pete, E. I. du Pont de Nemours and Co.

Groundwood Fading and Mechanism of Peroxide Bleaching, by J. A. Van den Akker, Institute of Paper Chemistry.

Dinner, followed by address by R. E. Canfield, secretary-Treasurer, Groundwood Paper Manufacturers Association.

Wednesday, September 29, 1948

Control of Slime in Groundwood Mills, by R. B. Martin and J. Chamberlin, Wallace and Tiernan Co.

Microbiological Control in a Groundwood Mill.

Microorganism Control in Mechanical Pulp Mills, by S. J. Buckman, Buckman Laboratories, Inc.

Utilization of Hardwoods for Mechanical Pulp, by E. R. Schafer, U. S. Forest Products Laboratory.

Trends in Mechanical Pulping Operations, by Henry J. Perry, Frederic C. Clark Associates.

Agricultural Residue Pulps -- High-Yield Straw Pulps For Fine Papers*

By S. I. Aronovsky[1], G. H. Nelson[2], A. J. Ernst[3], H. M. Sutcliffe[4], and E. C. Lathrop[5]

Abstract

The pulp and paper industry of this country is becoming increasingly interested in the possibilities of using agricultural residue pulps for fine papers. The lower cellulose contents of the agricultural residues and the consequently lower yields of papermaking fiber generally produced from these residues have often put these materials at an economic disadvantage when compared with wood. The neutral sulphite process described, giving high yields of relatively strong, easy bleaching pulps from agricultural residues, should partly overcome this disadvantage. The present paper gives a more detailed study of this process.

The data show that yields of 52 to 55% of screened pulp were obtained by cooking sound wheat straw with 8% sodium sulphite and 2 to 3% sodium carbonate on the basis of dry straw, for 2 hours at 170°C. (100 p.s.i.), using a total liquid to straw ratio of 7:1. The unbleached pulp had a maximum bursting strength (Mullen) of 85 to 95 points, a tensile strength at maximum burst of about 170 grams per ream pound, and a freeness (Schopper-Riegler) of 400 to 500 ml. The relatively low tear resistance of 40 to 60 grams per ream pound, due to the shortness of the wheat straw fiber, was somewhat greater than that found for hardwood soda pulp.

Bleaching these neutral sulphite straw pulps to a brightness of 70 and above required 5 to 7% total chlorine and reduced the yields to approximately 49 to 53% of the original weight of dry straw. Bleaching also enhanced the strength properties of the pulps, particularly the bursting strength and folding endurance. The bleached pulps hydrated more readily, as indicated by the reduced beating periods required to reach maximum burst than the unbleached pulps.

An analysis of the data indicates, on the basis of the pulps yields, bleach requirements and strength characteristics, that 6 to 8% sodium sulphite plus 2 to 4% sodium carbonate give the optimum results under the condition employed in these studies.

This bleached neutral sulphite straw pulp should be completely satisfactory for blending with wood and other paper pulps in the production of fine specialty papers such as writing, book, magazine, and litho, as well as in art papers and bristol boards. The inclusion of the straw pulp in the furnish should result in lower beating and refining costs and in producing papers with better formation and improved strength and printing characteristics.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948.

[1] Member TAPPI; In Charge, Pulp and Paper Section, Agricultural Residues Division, Northern Regional Research Laboratory,[6] Peoria, Ill.
[2] Chemical Engineer, Pulp and Paper Section, Agricultural Residues Division, Northern Regional Research Laboratory,[6] Peoria, Ill.
[3] Paper Technologist, Pulp and Paper Section, Agricultural Residues Division, Northern Regional Research Laboratory,[6] Peoria, Ill.
[4] Chemist, Pulp and Paper Section, Agricultural Residues Division, Northern Regional Research Laboratory,[6] Peoria, Ill.
[5] Member TAPPI; Head, Agricultural Residues Division, Northern Regional Research Laboratory,[6] Peoria, Ill.
[6] One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

It has long been known that good pulps for specialty papers can be produced from straw and other fibrous agricultural residues. However, while some papermaking pulps from straw and other similar residues are manufactured in various parts of the world, there is no commercial production of such pulps in this country, outside of a relatively small tonnage used for corrugating strawboard. Many factors have contributed toward developing this situation, the more important factors being: The relatively high handling costs in collecting, baling, and storing these residues; the generally lower cellulose contents of the agricultural residues as compared to woods; and the lack of a concerted research program to determine the suitability of these agricultural residue fibers for various types of specialty papers.

Cooperative efforts, in the past few years, of the Agricultural Residues Division of the Northern Regional Research Laboratory, the TAPPI Fibrous Agricultural Residues Committee, the strawboard industry, and the farm equipment manufacturers have resulted in increased and more efficient mechanized methods of collecting, baling, and preserving straws *(1,7,12)*. It is expected that, as a consequence of these efforts, the cost of straw in the mill yards will be reduced below the inflated present cost through decreased manual handling, and decreased losses of fiber from excessive weathering and microbial attack. This possibility, together with rising paper requirements and decreasing supplies and higher costs of suitable pulpwoods, should make straws and other agricultural residues more attractive as raw materials for pulp and paper production.

The general program of the Agricultural Residues Division and its Pulp and Paper Section has already been reported *(8)*. Some preliminary work on agricultural residue pulps involving the equipment and methods used in preparing and testing the pulps has also been described *(3, 4)*.

The relatively lower cellulose contents of the common fibrous agricultural residues, as compared to those of the pulpwoods, have been responsible to a large degree for the small industrial production of papermaking pulps from these residues, particularly where adequate supplies of pulpwood were available. In planning the attack on this problem it was noted that the total carbohydrate fraction, termed "holocellulose" *(11)*, of these residues was approximately the same as that found in wood; whereas the agricultural residues contained less alpha-cellulose, they had a larger content of hemicelluloses, mainly pentosans, than generally occur in wood. The presence of hemicelluloses in a pulp has beneficial effects on its papermaking characteristics. It was therefore thought that the production of holocellulose pulps from agricultural residues might be a way to make these residues attractive to industry.

The use, on a commercial scale, of the chemicals and steps required in the quantitative laboratory preparation of holocellulose appeared quite impractical. Many laboratory experiments were carried out in an effort to find a means for producing high yields of agricultural

TABLE I.—PROXIMATE CHEMICAL ANALYSIS OF WHEAT STRAWS

(All values, except moisture, are on the moisture-free basis)

Straw number (NRRL)	2852	4082
Straw variety	Wisconsin pedigree	Kawvale
Crop year	1943	1945
Constituent:	%	%
Moisture	9.1	8.3
Ash	8.1	6.3
Extractives		
Alcohol-benzene (1:2)	4.5	2.5
Hot water	11.9	10.0
One per cent NaOH	44.1	41.2
Lignin	20.1	16.8
Pentosans	27.6	31.9
Cross and Bevan cellulose (ash-free)	49.1	54.7
Pentosans in C & B cellulose	...	27.0
Alpha-cellulose	34.8	37.3
Pentosans in alpha-cellulose	...	4.2

residue pulps suitable for the production of fine papers. Included in these experiments were chlorination in various organic solvents, the use of chlorites both alone and in combination with other pulping and bleaching agents, and chlorination in aqueous media under pressure *(9)*.

While apparently satisfactory pulps, based on yield and chemical analysis, were produced by some of these methods, the procedures did not seem to be feasible from a practical and economic viewpoint.

Recent work at the Northern Regional Research Laboratory on various pulping processes applied agricultural residues has shown that high yields of fairly strong pulps can be produced by cooking these residues with sodium sulphite *(2)*. These results warranted further studies on this process, and the present paper deals with this investigation.

Experimental

Raw Material

The raw material used in these studies was straw from combined, soft winter wheat (Kawvale variety) from the 1945 crop grown in central Illinois. The straw was bright, sound and relatively free from chaff. It was chopped to lengths of 1 to 3 inches in an ensilage cutter, and then run over a 40-mesh vibrating screen to remove dirt and fines. The loss from 10 bales of straw (approximately 550 pounds varied from 0.75 to 1.07%, and average of 0.93%. The proximate chemical analysis of this straw is given in Table I, where it is compared with that of the soft winter wheat straw (Wisconsin Pedigree) obtained from the same farm in 1943 and used in previous studies *(2)*.

The data in Table I show that there were some differences between these two straws, particularly in the ash, lignin, Cross and Bevan cellulose, and alpha-cellulose contents. These differences were probably due to several factors, such as wheat variety and the difference in cultural and weather conditions in the two crop years, and possibly also to the fact that the 1943 straw was slightly weathered whereas the 1945 straw was bright and sound. Comparable cooks were made on the straws of these two varieties with sodium sulphite under exactly similar conditions. The results, given in Table II, show that the Kawvale variety was superior, in practically all respects, to the older straw, as anticipated from the analytical data in Table I.

Preparation and Analyses of Pulps

The pulps were prepared from the Kawvale straw in the manner previously described *(2)*. The procedures used for chemical analysis, for bleaching, and for testing the physical strength characteristics of the pulps were all TAPPI methods, or modifications of these methods already reported *(2, 3)*. One additional modification was incorporated in the method for determining lignin in bleached pulps: the bleached pulp was hydrolyzed for 2 hours with a 2% solution of sulphric acid at boiling temperature, and the hydrolyzed residue was dried and then treated with 72% sulphuric acid in the usual manner.

The data on pulping, bleaching, chemical analyses, and testing are given in Tables III to XII, and shown graphically in Figs. 1 to 4. All of the analytical data presented here are the mean of at least two determinations in good agreement.

Results and Discussion

Effect of Raw Material

The differences in the chemical analyses and pulping characteristics of the two straws and in the properties of the pulps derived from them, as shown in Tables I and II, are probably exaggerated somewhat by the fact that one of these straws was slightly weathered. The effects of weathering on straw have been shown to result in increased lignin and ash content, decreased cellulose and hemicellulose content and increased solubility in dilute alkali *(5)*.

It is impractical to expect that all of the straw, required annually for the manufacture of pulp and paper, can be obtained in a completely sound and unweathered condition and stored without change. The possibility of meeting a mill's requirements with straw of one particular variety and from one particular location is also remote since the number of wheat varieties grown in any one section of the country is quite large and variable. A small difference in the behavior of straws produced in differenct localities and under different cultural and climatic conditions is to be expected. This difference is also encountered with pulpwoods and should entail no particular difficulty in pulp and paper production; such variations can be smoothed out fairly well by suitable blending of the straws, or preferably of the pulps produced from these straws, a practice that is commonly used in woodpulp production.

Effect of Increasing the Alkalinity of the Sodium Sulphite Pulping Liquor

Addition of Sodium Bicarbonate. It is well known that the addition of alkali to sodium sulphite liquor has beneficial efforts in the semichemical pulping of wood. Stronger and more pliable pulps are produced, and corrosive effects on the pulping equipment are minimized by this means. The preliminary results obtained by pulping straw with sodium sulphite also show the advantage of adding sodium bicarbonate *(2)*. A series of cooks was therefore run in which the sodium sulphite was kept constant at 8% of the

TABLE II.—PULPING CHARACTERISTICS OF KAWVALE AND WISCONSIN PEDIGREE WHEAT STRAWS

Straw variety	Wisconsin pedigree	Kawvale
Cook number	C442	C438
Cooking conditions:		
Na_2SO_3, %	8.0	8.0
Time, hr.	2.0	2.0
Temperature, °C.	170	170
Ratio, liquid to solid	7:1	7:1
pH of liquor—at start	9.0	9.0
pH of liquor—at end	5.4	5.3
Pulp yields:		
Crude, %	58.0	56.6
Screened, %	48.8	48.8
Screenings, %	3.5	1.4
Fines, %	5.7	6.4
Pulp analysis:		
Pentosans, %	20.3	21.7
Ash, %	8.6	7.6
Lignin, %	11.4	8.3
Permanganate number	42	33
Bleach consumption (70 brightness), %	23.2	14.3
Fiber loss—basis screened pulp, %	9.8	6.2
Bleach yield—basis original straw, %	44.0	45.8
Beater evaluation—at maximum bursting strength:		
Beating time, min.	60	60
Freeness (Schopper-Riegler), ml.	530	570
Bursting strength, points/ream pound × 100	73	78
Tensile strength, grams/ream pound	143	146
Tear resistance, grams/ream pound × 100	55	62
Folding endurance, double folds	328	408
Density	0.89	0.90

weight of dry straw and to which different amounts of sodium bicarbonate were added. The data on these cooks are given in Table III.

The results show that the addition of sodium bicarbonate had beneficial effects on the yields of screened pulp and on the chemical and strength characteristics of the pulps. Increasing the amounts of bicarbonate from 3.2% to 6.4% of the weight of dry straw had practically no effect on the pulp yields. However, stronger pulps with somewhat better chemical characteristics and lower bleach requirements were obtained with the increased amounts of bicarbonate in the cooking liquors. The use of bicarbonate improved the brightness of the unbleached pulp.

It will be noted from Table III, as well as from data discussed later, that the strength properties of the pulps are more or less directly tied in with the pH of the spent cooking liquor. Apparently, liquors which have a pH of less than 6.0 at the end of the cook produce pulps with inferior strength properties. This may be due to the lower degree of delignification of the pulp fibers as well as a reduction in the pentosan content of the pulp as a result of the relatively greater acidity of the pulping liquor.

Addition of Sodium Carbonate. Sodium bicarbonate costs aproximately three times as much as sodium carbonate on the basis of sodium content. Since carbon dioxide is almost invariably formed during pulping at elevated temperatures, it was thought that sodium carbonate should give results similar to those obtained with the bicarbonate. The data on a series of cooks made with sodium carbonate added to the sodium sulphite, under the same pulping conditions used with the bicarbonate, are given in Table IV.

With sodium carbonate in amounts equivalent to the sodium bicarbonate previously used, somewhat lower yields of screened pulp and slightly larger amounts of screenings were obtained. The sodium carbonate-cooked pulps contained a little more ash than those prepared with sulphite and bicarbonate, but the other chemical characteristics were approximately the same. The strength properties of the carbonate and bicarbonate-treated pulps were approximately the same. It is apparent from these data that the economic advantage of sodium carbonate over the bicarbonate outweighs the slight superiority in quality of the pulp produced with bicarbonate.

The data in Table IV also show that there was trend towards decreased yields of screened pulp and toward slightly better pulp quality as the sodium carbonate in the cooking liquor was increased from 2 to 6% of the weight of straw. Although the actual increase in strength characteristics of pulp made with more than 2% carbonate is probably insufficient to warrant the cost of additional chemical, the use of 3% instead of 2% carbonate may be advisable from the standpoint of added insurance against too low a pH value of the liquor at the end of cooking and against its possible corrosive effects on the pulping equipment.

Effect of Increasing Amounts of Sodium Sulphite

The results of increasing the sodium sulphite in the cooking liquor, with all of the other pulping variables held constant, are given in Table V, and shown graphically in Fig. 1. The pH of the used pulping liquor increased regularly with increasing chemical up to 7% sodium sulphite; no apreciable increase in pH of the used liquor was noted with the larger amounts of chemical. The yields of screened pulp seemed to be more or less unaffected by the increase in sodium sulphite from 3 to 10% of the weight of straw, although the amounts of screenings produced decreased some-

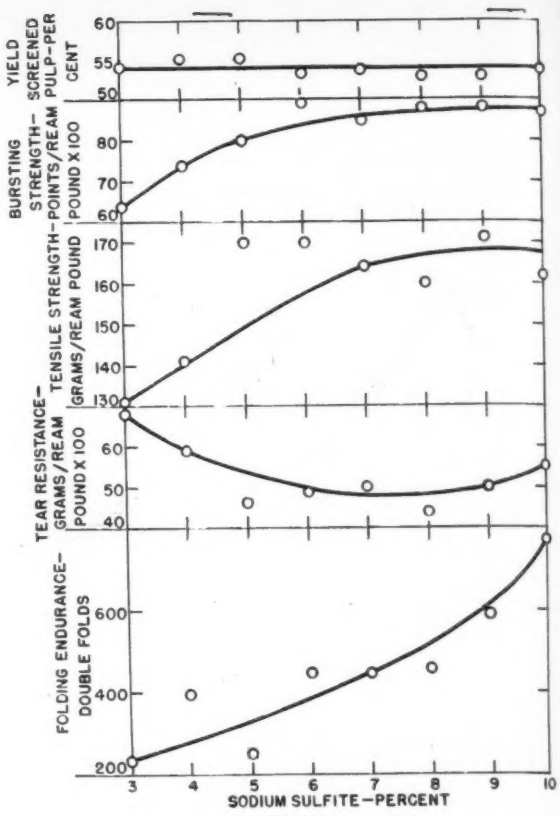


Fig. 1
Effect of increasing sodium sulphite on the yields and strength properties of neutral sulphite wheat straw pulps.

what. The lignin content and bleach requirement (to brightness 70) of the pulps decreased regularly with increasing sodium sulphite used for pulping.

The strength characteristics of the pulps, particularly the bursting and tensile strengths, increased with increasing concentration of chemical up to about 6% sodium sulphite; beyond this concentration no particular trend was noted. Since the tear resistance of these pulps was relatively low anyway, the variations in tear values obtained in this series of cooks have no particular significance. It should be stated at this point, however, that the rawer pulps produced by the neutral sulphite process did show a trend toward somewhat higher tear resistance. The folding endurance of the pulps increased fairly regularly with increasing concentration of cooking chemical, as would be expected from the greater degree of delignification obtained.

It is apparent from these data that 6 to 8% sodium sulphite produced pulps in high yield and with good strength properties. The pulp prepared with 6% sodium sulphite and 3% sodium carbonate should be satisfactory for use in unbleached papers. For bleached pulps, however, it would probably be preferable to use 8% sodium sulphite owing to the much lower bleach requirement of the pulp produced with the larger amount of chemical.

Effect of Time of Cooking

Increasing the time of cooking when using the neutral sulphite process, with all of the other pulping conditions held constant, had a distinctly deleterious effect on the resultant pulp (Table VI, Fig. 2). The increase in cooking period from 2 to 6 hours resulted in lower yields of screened pulp with drastically lowered strength properties, particularly bursting strength and folding endurance. The pH of the spent liquor dropped with increased

[a] Basis original moisture-free straw.
[b] Used 25 liters of black liquor from cook 504.
[b] Basis moisture-free unbleached screened pulp.
[c] All values at or near maximum bursting strength.
[d] Used 25 liters of black liquor from cook 503.

NEUTRAL SULPHITE WHEAT STRAW PULPING, COOKING CONDITIONS, YIELDS, AND CHEMICAL AND PHYSICAL PROPERTIES OF PULPS

TABLE III.—EFFECT OF SODIUM BICARBONATE

Cook Number	Cooking Conditions: Chemical [a] % Na_2SO_3	Chemical [a] % $NaHCO_3$	Ratio Liquid/Solid	Temp., °C.	Time, hr.	pH of Liquor: Fresh	pH of Liquor: Used	Pulp Yields [a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analyses [b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Chlorine Consumption, [b] %	Fiber Loss, [b] %	Bleached Pulp Yield, [a] %	Beating and Strength Characteristics [c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
438	8	0	7:1	170	2	9.0	5.3	56.6	48.8	1.4	6.4	7.6	21.7	8.3	33	22	14.3	6.6	45.8	60	570	47	78	146	62	408	0.90
610																											
611	8	3.2	7:1	170	2	8.5	6.8	59.4	54.1	0.7	4.6	6.0	27.6	4.7	15	29	6.4	5.9	51.1	45	450	47	70	171	65	582	0.84
612																											
613	8	4.8	7:1	170	2	8.5	7.6	60.3	54.0	1.0	5.3	6.4	28.3	4.5	15	29	7.3	6.5	50.7	45	460	47	94	176	59	537	0.79
614																											
615	8	6.4	7:1	170	2	8.5	8.3	59.3	53.8	1.2	4.3	7.0	28.8	4.1	13	29	5.8	6.7	50.4	45	390	48	95	179	59	558	0.82

TABLE IV.—EFFECT OF SODIUM CARBONATE

Cook Number	Na_2SO_3	Na_2CO_3	Ratio Liquid/Solid	Temp., °C.	Time, hr.	pH of Liquor: Fresh	pH of Liquor: Used	Pulp Yields [a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analyses [b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Chlorine Consumption, [b] %	Fiber Loss, [b] %	Bleached Pulp Yield, [a] %	Beating and Strength Characteristics [c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
438	8	0	7:1	170	2	9.0	5.3	56.6	48.8	1.4	6.4	7.6	21.7	8.3	33	22	14.3	6.6	45.8	60	570	47	78	146	62	408	0.90
443																											
448	8	2	7:1	170	2	10.4	7.3	60.2	53.4	1.2	5.6	8.2	27.0	5.4	18	31	6.6	6.2	50.3	60	445	47	89	168	52	426	0.91
447																											
465	8	3	7:1	170	2	10.4	9.3	60.3	52.9	2.0	5.4	8.9	26.3	5.4	15	30	7.1	5.8	50.0	60	415	48	88	160	44	456	0.91
476																											
444	8	4	7:1	170	2	10.5	8.8	60.8	51.6	1.9	7.3	8.7	26.9	4.0	14	32	6.7	6.2	48.6	60	455	48	92	165	54	509	0.84
445	8	6	7:1	170	2	10.9	8.8	59.1	51.2	2.2	5.7	8.3	26.7	4.0	13	31	6.4	7.6	47.6	60	480	47	99	174	51	497	0.86

TABLE V.—EFFECT OF INCREASING AMOUNTS OF SODIUM SULPHITE

Cook Number	Na_2SO_3	Na_2CO_3	Ratio Liquid/Solid	Temp., °C.	Time, hr.	pH of Liquor: Fresh	pH of Liquor: Used	Pulp Yields [a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analyses [b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Chlorine Consumption, [b] %	Fiber Loss, [b] %	Bleached Pulp Yield, [a] %	Beating and Strength Characteristics [c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
539	3	3	7:1	170	2	10.2	4.9	65.8	54.2	3.8	7.8	6.8	22.0	14.7	62	13	36.8	18.4	45.8	60	570	46	64	131	68	232	0.70
538	4	3	7:1	170	2	10.2	5.3	63.5	55.3	2.4	5.8	7.8	21.7	12.8	52	15	29.7	15.2	48.0	60	570	43	74	141	59	395	0.74
582	5	3	7:1	170	2	10.3	5.6	64.6	55.4	1.6	7.6	6.4	23.9	8.8	43	17	23.4	12.4	49.3	60	430	47	80	170	46	250	0.77
494	6	3	7:1	170	2	10.1	7.2	60.0	53.1	2.2	4.7	8.0	24.9	6.0	25	24	11.8	6.6	49.8	45	540	46	89	170	49	447	0.84
492	7	3	7:1	170	2	10.2	7.8	60.2	53.7	1.3	5.2	8.3	26.2	5.6	18	27	10.5	8.5	49.5	45	540	47	85	164	50	447	0.84
447																											
465	8	3	7:1	170	2	10.4	9.3	60.3	52.9	2.0	5.4	8.9	26.3	5.4	15	30	7.1	5.8	50.0	60	415	48	88	160	44	456	0.91
489	9	3	7:1	170	2	10.0	7.8	60.0	52.9	1.7	5.4	8.5	26.5	4.6	13	34	4.7	3.9	50.9	45	505	47	88	171	50	589	0.79
490	10	3	7:1	170	2	10.1	7.8	58.3	53.8	1.2	3.3	7.5	28.2	4.8	11	32	4.0	7.0	50.3	45	530	47	87	162	55	770	0.79

TABLE VI.—EFFECT OF TIME OF COOKING

Cook Number	Na_2SO_3	Na_2CO_3	Ratio Liquid/Solid	Temp., °C.	Time, hr.	pH of Liquor: Fresh	pH of Liquor: Used	Pulp Yields [a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analyses [b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Chlorine Consumption, [b] %	Fiber Loss, [b] %	Bleached Pulp Yield, [a] %	Beating and Strength Characteristics [c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
443																											
448	8	2	7:1	170	2	10.4	7.3	60.2	53.4	1.2	5.6	8.2	27.0	5.4	18	31	6.6	6.2	50.3	60	445	47	89	168	52	426	0.91
458	8	2	7:1	170	3	10.0	5.4	62.4	53.4	0.8	8.2	8.0	26.8	5.1	27	26	11.5	3.1	51.8	60	520	46	76	145	49	323	0.90
461	8	2	7:1	170	4	10.1	5.1	57.3	50.9	0.6	5.8	8.8	21.8	7.1	25	24	11.1	2.8	49.5	60	600	47	67	137	56	162	0.86
462	8	2	7:1	170	6	10.1	4.7	56.3	49.1	0.9	6.3	9.2	16.1	7.9	42	17	26.6	6.0	46.3	60	635	44	42	102	39	15	0.88

TABLE VII.—EFFECT OF TEMPERATURE OF COOKING

Cook Number	Na_2SO_3	Na_2CO_3	Ratio Liquid/Solid	Temp., °C.	Time, hr.	pH of Liquor: Fresh	pH of Liquor: Used	Pulp Yields [a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analyses [b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Chlorine Consumption, [b] %	Fiber Loss, [b] %	Bleached Pulp Yield, [a] %	Beating and Strength Characteristics [c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
461	8	2	7:1	170	4	10.1	5.1	57.3	50.9	0.6	5.8	8.8	21.8	7.1	25	24	11.1	2.8	49.5	60	600	47	67	137	56	162	0.86
449	8	2	7:1	160	4	10.5	7.6	59.3	52.3	1.6	5.4	8.2	29.5	4.9	16	33	7.2	5.0	49.8	60	435	46	91	160	39	404	0.88
528	8	2	7:1	150	4	10.0	7.3	64.6	44.7	13.3	6.6	8.5	28.5	6.0	19	29	9.9	1.6	44.0	60	470	45	89	169	47	564	0.99

TABLE VIII.—CONCURRENT EFFECT OF TIME AND TEMPERATURE OF COOKING

Cook Number	Na_2SO_3	Na_2CO_3	Ratio Liquid/Solid	Temp., °C.	Time, hr.	pH of Liquor: Fresh	pH of Liquor: Used	Pulp Yields [a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analyses [b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Chlorine Consumption, [b] %	Fiber Loss, [b] %	Bleached Pulp Yield, [a] %	Beating and Strength Characteristics [c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
443																											
448	8	2	7:1	170	2	10.4	7.3	60.2	53.4	1.2	5.6	8.2	27.0	5.4	18	31	6.6	6.2	50.3	60	445	47	89	168	52	426	0.91
449	8	2	7:1	160	4	10.5	7.6	59.3	52.3	1.6	5.4	8.2	29.5	4.9	16	33	7.2	5.0	49.8	60	435	46	91	160	39	404	0.88
452	8	2	7:1	150	8	10.3	7.3	64.3	56.5	2.3	5.5	9.0	27.2	4.9	17	32	5.8	2.4	55.2	60	400	46	84	168	46	271	0.84

TABLE IX.—LARGER SCALE COOKS

Cook Number	Na_2SO_3	Na_2CO_3	Ratio Liquid/Solid	Temp., °C.	Time, hr.	pH of Liquor: Fresh	pH of Liquor: Used	Pulp Yields [a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analyses [b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Chlorine Consumption, [b] %	Fiber Loss, [b] %	Bleached Pulp Yield, [a] %	Beating and Strength Characteristics [c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
453	8	2	4:1 to 12:1	150	8	...	6.5	63.8	55.7	2.3	5.8	7.2	29.8	5.7	25	27	10.0	5.5	52.8	60	425	46	80	166	46	260	0.84
593	8	3	7:1	170	2	...	7.0	62.8	54.1	1.5	6.2	7.9	29.1	5.4	15	28	6.4	9.5	49.4	45	445	46	84	167	46	351	0.84

TABLE X.—EFFECT OF REUSE OF SPENT NEUTRAL SULPHITE LIQUOR

Cook Number	Na_2SO_3	Na_2CO_3	Ratio Liquid/Solid	Temp., °C.	Time, hr.	pH of Liquor: Fresh	pH of Liquor: Used	Pulp Yields [a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analyses [b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Chlorine Consumption, [b] %	Fiber Loss, [b] %	Bleached Pulp Yield, [a] %	Beating and Strength Characteristics [c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
503	7	3	7:1	170	2	10.2	7.6	63.5	57.4	1.4	4.8	7.6	27.6	5.4	21	25	9.6	3.8	55.3	45	470	49	92	158	33	569	0.87
504 [d]	7	3	7:1	170	2	9.6	6.0	63.3	56.6	1.3	5.4	8.0	26.8	8.0	31	20	19.2	3.9	54.5	45	550	48	81	157	38	389	0.94
505 [e]	7	3	7:1	170	2	8.9	5.1	66.5	56.1	2.5	7.9	7.2	19.6	14.2	56	14	34.9	12.2	50.0	45	560	49	72	133	51	280	0.87

[a] Basis original moisture-free straw.
[b] Basis moisture-free unbleached screened pulp.
[c] All values at or near maximum bursting strength.
[d] Used 25 liters of black liquor from cook 503.
[e] Used 25 liters of black liquor from cook 504.

time of cooking, which may account for the increased brittleness of the resulting pulps. The increase in lignin content and decrease in pentosans was probably due to the greater acidity of the pulping liquor produced in the longer cooking periods. It is evident from these data that, under the conditions used in this series of cooks, 2 hours at 170° C. is the optimum pulping time.

Effect of Temperature of Cooking

It had been established from previous work that pulping straw for 2 hours at temperatures lower than 170° C. gave raw pulps. In order to obtain usable pulps with the neutral sulphite process at the lower temperatures, a cooking period of 4 hours was used for this series, keeping all the other pulping conditions constant. The data, given in Table VII and shown graphically in Fig. 3, show that under these conditions a cooking temperature of 160° C. was optimum, giving larger yields of screened pulp with higher bursting strength. As the temperature was reduced to 150° C. the yield of screened pulp dropped and the screenings increased considerably. In general, however, the pulp had better strength characteristics at the lower cooking temperature.

It was apparent that cooking for 4 hours at 160° C. gave results similar to those obtained with 2 hours at 170° C. This indicated that the process of pulping straw with a mixture of sodium sulphite and sodium carbonate might approximate a chemical reaction of the first order, as in the pulping of wood *(6)*. In order to check this point, a cook was made on wheat straw for 8 hours at 150° C. The results of the concurrent increase in cooking time and decrease in cooking temperature are given in Table VIII. The pulps from these three cooks had approximately the same chemical and physical strength characteristics. The yields of screened pulp and screenings showed a slight tendency to increase with decreasing temperature and increasing time of cooking, but the actual differences between these values for the three cooks were very small. Pulping straw with neutral sulphite therefore approximates a chemical reaction of the first order in which the reaction velocity doubles for each 10° C. rise in temperature.

Larger-Scale Cooks

All of the foregoing cooks were made in the cylindrical, 12-gallon tumbling autoclaves previously described *(3)*. To determine if similar results would be obtained on a larger scale, two cooks were made in a spherical rotary autoclave with an internal diameter of 3 feet. Approximately six times as much straw could be cooked in this autoclave as in the cylindrical units. One cook was made by indirect heating with 8% sodium sulphite and 3% sodium carbonate, with the other pulping conditions the same as for the smaller cooks. In the other cook direct steaming was applied, and the ratio of total liquid to straw placed in the autoclave was 4 to 1. This cook was run for 8 hours at 150° C. At the end of this cooking period the ratio of total liquid to original straw was approximately 12 to 1, due to condensation of the steam used for cooking. When cooking in this large autoclave was completed the pressure was reduced to atmospheric by relief, and the cooked residue was removed and defibered in a beater before screening. The data on these larger cooks are given in Table IX.

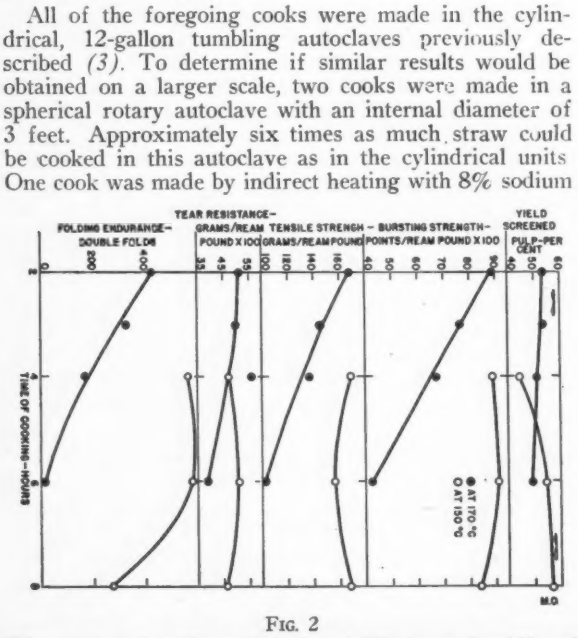


Fig. 2

Effect of time of cooking at 170° C. and 150° C. on the yields and strength properties of neutral sulphite wheat straw pulps.

Slightly larger yields of screened pulp were obtained from the spherical autoclave than from comparable cooks made in the smaller cylindrical units, but the physical strength characteristics of the pulps made in the spherical autoclave were somewhat lower. The differences in yield and properties of the wheat straw pulps produced in these two types of autoclaves were quite small. It follows, therefore, that the results produced in large-scale pulping would be expected to be very similar to those obtained with the small laboratory equipment.

It should be noted at this point that, when pulping straw, better results are obtained by "blowing" the autoclave contents than by emptying the autoclave at atmospheric pressure. The slightly lower yields of screened pulp resulting from blowing are probably due to the shattering, and subsequent loss through screening, of the cooked node material in the straw. This node material, consisting largely of platelets and cells, probably acts as a filler in the pulp and tends to reduce the strength properties. It is very likely that the reported difficulty with the "slowness" of straw pulps, particularly from cooks made with strong alkalis, may be due in part to retention of a large portion of node material in the pulp. Blowing the digester contents tends to shatter the nodes into smaller particles which are largely lost through screening and in the white water. While this loss of node material reduces slightly the over-all yield of pulp, it is felt that the gain in the freeness and strength values of the pulp more than compensate for this small loss in yield. Besides, the inclusion of a large proportion of the node material in a pulp not only reduces the papermaking quality of this pulp but it also consumes chemicals in bleaching and purification, as well as power in pumping and refining, without any beneficial results.

Effect of Re-use of Waste Liquor

The building and operation of plants to recover the inorganic chemicals used in pulping processes are relatively expensive, particularly when the black or waste liquors contain these chemicals in low concentration. It was thought that complete reuse of the waste liquors as such might obviate the need for a recovery unit and might also reduce the amount of active chemical required for pulping. Some cooks were made, therefore, in which the makeup liquor consisted entirely of waste liquor and washings from previous cooks: cook 503, given in Table X, was made with fresh water and chemical; in 504 the total liquid, other than the moisture in the straw, was supplied by the waste liquor and first wash liquor obtained from cook 503; the liquor in cook 505 consisted similarly of the black and wash liquor from cook 504. It is evident from the data in Table X that the complete substitution of fresh water by waste liquor had deleterious effects on the yields and properties of the resulting pulps. These effects may have been due partly to the decrease in pH of the liquor dur-

TABLE XI.—EFFECT OF PULP CONSISTENCY ON BLEACHING NEUTRAL SULPHITE WHEAT STRAW PULP

Type of Bleaching	Unbleached Pulp	Bleached Pulp: Single Stage		Bleached Pulp: Three Stages					
				1st	2nd	3rd	1st	2nd	3rd
Pulp consistency, %	...	4	10	4	12	12	4	4	4
Bleach consumed,[a] %	...	10.3	11.5		8.9			9.0	
Fiber loss,[a] %	...	1.6[b]	2.9[b]		6.6			4.1	
Brightness (Hunter), %	27	69	70		75			72	
Ash, %	7.2	8.5	8.7		6.8			6.9	
At maximum bursting strength									
Freeness (S.-R.), ml.	425	390	440		400			390	
Bursting strength, pts./ rm. lb. × 100	80	79	77		87			87	
Tensile strength, grams/ream pound	166	160	144		146			157	
Folding endurance, double folds	260	315	279		531			533	

[a] Based on moisture-free screened, unbleached pulp.
[b] Probably low.

ing the cooking, causing some embrittlement of the pulp. This was indicated by the decrease in pentosan content and folding endurance of the screened pulp, and also by the increased amount of fines produced. It was also noted that the degree of delignification decreased quite rapidly with reuse of the waste liquor. A part of the fresh chemical added to cooks 504 and 505 may have reacted with the constituents of black liquor from the previous cooks, resulting in an insufficient supply of active chemical to pulp the straw properly. Based on these preliminary results, the complete reuse of straight neutral sulphite waste liquor for subsequent pulping cannot be recommended at this time. More work must be done along this line before definite conclusions can be drawn on the reuse value of neutral sulphite black liquor.

Bleached Neutral Sulphite Straw Pulp

Single- and three-stage bleaches were carried out on the pulp from cook 453 (spherical autoclave, 8% sodium sulphite plus 2% sodium carbonate, 8 hours at 150° C.) at different consistencies. The data given in Table XI show that three-stage bleaching produced a pulp with higher brightness and generally higher strength characteristics, particularly folding endurance. In this respect chlorination at low consistency, and extraction with alkali and hypochlorite treatment at high consistency, gave results superior to those produced by three-stage bleaching at low consistency. Although the fiber loss by the combined low- and high-consistency, three-stage bleaching method was slightly higher than that from the low consistency procedure, the former method was used for the bleaching studies because of the higher brightness and quality of the bleached pulp.

The data on bleaching several pulps produced with 8% sodium sulphite plus 2 or 3% sodium carbonate at 170° C. for 2 hours are given in Table XII. These results were in close agreement with those previously reported for bleached neutral sulphite pulps *(2)*. Bleaching lowered the ash and, of course, the lignin in the pulp, with little or no effect on the pentosans. The bleached yields were all 50% or more of the original straw, with a total chlorine consumption based on unbleached pulp of 5 to 7%. The bursting strength and tear resistance were generally increased somewhat, and the tensile strength slightly reduced, on bleaching the pulps. The folding endurance was nearly doubled by by bleaching.

The comparison of the strength characteristics of bleached neutral sulphite wheat straw pulp (cooks 549-550) with those of commercial bleached hardwood soda and softwood sulphite pulps is shown in Fig. 4. It is evident that the wheat straw pulp compared favorably with the softwood sulphite pulp and was considerably

TABLE XII.—EFFECT OF BLEACHING ON THE CHEMICAL AND PHYSICAL PROPERTIES OF NEUTRAL SULPHITE WHEAT STRAW PULPS

Cook Number	Pulp Yields[a]: Crude, %	Screened, %	Screenings, %	Fines, %	Chemical Analysis[b]: Ash, %	Pentosans, %	Lignin, %	$KMnO_4$ No.	Brightness (Hunter), %	Bleaching: Stages[d]	Chlorine Consumption,[b] %	Fiber Loss,[b] %	Bleached Pulp Yield,[a] %	Beating and Strength Characteristics[c]: Time, min.	Freeness S.R., ml.	Basis Weight (25×40—500), lb.	Bursting Strength, pts./rm. lb. × 100	Tensile Strength, g./ream pound	Tear Resistance, g./rm. lb. × 100	Folding Endurance, double folds	Apparent Density, g./ml.
443	61.1	53.0	1.4	7.0	8.0	27.8	5.0	18	31	3	6.2	6.4	49.8	60	450	46	91	166	55	421	0.88
443B					6.6	31.5	1.5		78		5.7	5.6	50.2	60	375	48	90	138	47	708	0.91
448	59.2	53.7	1.2	4.3	8.4	26.2	5.7	17	30	3	7.0	5.7	50.8	60	440	48	86	169	48	730	0.94
448B					6.9	27.4	2.0		76		6.8	5.9	50.7	60	370	45	86	150	47	740	1.00
447	59.2	51.8	2.0	5.4	8.7	28.1	5.0	15	30	3	6.6	4.8	49.4	60	440	48	90	160	44	502	0.94
447B					7.3	28.6	3.5		74		6.6	5.5	49.1	60	360	47	87	157	43	927	0.96
465	61.3	54.0	1.9	5.4	9.1	24.4	5.8	16	31	3	7.6	6.7	50.6	60	430	48	87	160	43	410	0.89
465B					7.9	26.5	3.4	..	70	3	5.6	4.5	51.7	60	425	49	89	156	55	886	0.97
549}	61.5	55.5	1.3	4.5	7.7	25.7	5.1	16	27	..	6.8	3.4	53.7	60	430	49	92	163	47	643	0.90
550}																					
549B}					6.7	25.9	2.0	..	72	3	6.2	6.5	52.1	45	...	48	96	154	60	1149	0.89
550B}																					

[a] Basis original moisture-free straw.
[b] Basis moisture-free pulp.
[c] All values at or near maximum Mullen.
[d] Four per cent consistency for chlorination, 12% consistency for alkali extraction and for hypochlorite treatment.
B—Bleached.

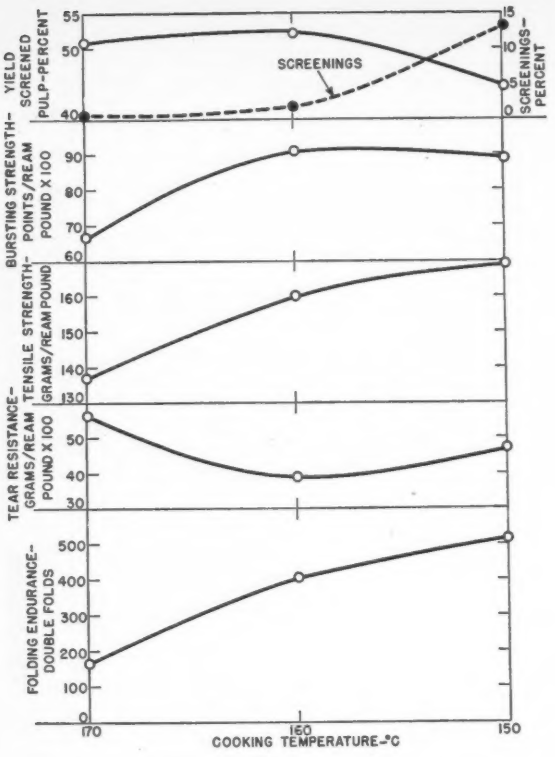


FIG. 3

Effect of cooking temperature on the yields and strength properties of neutral sulphite wheat straw pulps (cooking period, 4 hours).

stronger in all respects than the hardwood soda pulp. The yield and relatively high quality of the bleached neutral sulphite wheat straw pulp should make this product particularly suitable for blending with other papermaking fibers in the manufacture of specialty papers.

General Considerations

The use of sodium sulphite for the manufacture of papermaking pulps is not new, and neither is the application of this process to the pulping of straw and agricultural residues. Although this method of pulping was known about 1880, its first commercial application to wood was not started until about 1920. A small amount of neutral sulphite wood pulp is manufactured at the present time for certain specialty papers. The use of this process for the semichemical pulping of hardwoods has received added impetus in recent years because of the increased scarcity of suitable softwood pulps.

The sporadic and scattered attempts to produce usable pulps from agricultural residues by the sodium sulphite process have not met with success mainly because the investigations were neither concerted enough nor planned well enough, from the technological as well as the economic viewpoint, to develop the optimum procedures and products. The promising application of the neutral sulphite process to straw, as described in the present paper, is the result of a concerted effort in accordance with the program developed in the Northern Laboratory on the industrial utilization of agricultural residues. While this process development is not to be considered as completed, the data obtained are sufficiently promising and interesting to merit serious consideration of neutral sulphite straw pulp for fine specialty papers by the pulp and paper industry.

No attempt is made to suggest that the neutral sulphite straw pulp is an all-purpose product suitable by itself for any kind of paper. Rather, this pulp should be used as one ingredient in a blend, to which this pulp contributes properties not so easily or so well provided by other pulps. The easy-bleachability, high hemicellulose content, and relatively high strength properties of this pulp suggest a number of types of paper to which it would contribute desirable characteristics. The relatively short but very narrow straw fibers, when used in sufficient quantity with respect to the other fibers present, should result in considerably improved formation in writing, tablet, ledger, mimeo, and similar noncoated papers. It should also improve the printing characteristic of such papers since the hydrated straw fibers in the paper would tend to reduce surface fuzz. For the same reason straw pulp should improve the coating surface of papers, such as magazine or book, and thereby result in more uniform coating of the paper. Well-hydrated straw pulp tends to form tinny paper; the inclusion of such pulp should improve the stiffness of normally limp papers, such as filled magazine and book, as well as that of art and drawing papers. Many other types of papers would no doubt benefit from the addition of straw pulp to the furnish.

Different types of fibers should generally not be mixed and then processed together if the optimum characteristics of each type of fiber are to be brought out in the final paper. It is no more correct or desirable to subject a mixture of different fibers to the same type of processing than it is to try to pulp wood and straw together in the same digester. Pulps should be processed and refined separately to develop the desired characteristics of each pulp to its optimum, and then they should be blended and mixed thoroughly before reaching the paper machine. This procedure is particularly desirable when agricultural residue pulps are to be blended with wood pulp or other papermaking pulps. The straw pulp hydrates more easily on account of its high hemicellulose content. Preliminary experiments under way at the Peoria Laboratory indicate that blending of more or less beaten straw pulp with unbeaten or only slightly beaten softwood sulphite pulp produces papers which retain the desirable optimum characteristics of both types of fibers.

The pulping and pulp mill equipment required to produce neutral sulphite wheat straw pulp is practically the same as that used for the alkaline pulping of wood. This has already been demonstrated on a commercial scale in Holland. Shortly after the war a commission of Dutch papermakers visited the Northern Laboratory to discuss straw pulping, and the essential steps of the neutral sulphite pulping was outlined to them. Within three months after they had returned to Holland they were producing regularly about 100 tons per week of bleached neutral sulphite straw pulp, in a mill which had until then been used for making inferior acid sulphite straw pulp. According to their report *(10)*, the yields and properties of their commercial neutral sulphite pulp, made with the available pulp mill equipment, were essentially the same as those obtained by the Peoria Laboratory. The bleached pulp is used in Holland by itself and in admixture with other papermaking fibers for the production of fine specialty papers and boards.

Some straw papers produced in the past have had relatively high dirt and speck contents. It is recognized that the presence of excessive dirt in straw paper would be a serious disadvantage. Modern collection and baling practice with combine straw, however, should produce a raw material with considerably lower chaff and dirt content. Chopping the straw and dusting the chopped material, as practiced successfully on dirty esparto grass in England and on straw in Europe and in South

America, will result in a further reduction of dirt. Blowing the digester charge and screening the pulp, as described earlier in this paper, should practically eliminate the specks due to node material. Finally, the Vortrap, Dirtec, or similar equipment used successfully in cleaning up woodpulp, should work equally well with straw pulp. The commercial production of clean esparto paper in England and clean straw paper in Holland and in South America shows that, with proper handling, clean paper can be made commercially from straw and similar fibrous materials in the United States.

The exact cost of producing the neutral sulphite wheat straw pulp is not available at this time since no large-scale manufacture of this pulp exists in this country. However, a rough calculation may be obtained from the raw material costs, using December 1947 prices. The figures are based on a yield of 50% of bleached pulp obtained with the use of 8% sodium sulphite plus 2.5% sodium carbonate (based on oven-dry straw) for pulping, and 7% total chlorine (based on oven-dry screened, unbleached pulp) for bleaching:

RAW MATERIAL REQUIREMENTS FOR PRODUCING 1 TON OF AIR-DRY BLEACHED STRAW PULP

Straw—4,000 lb. at $14.00/ton	$28.00
Cooking chemicals	
Na_2SO_3—288 lb. at $2.60/100 lb.	7.49
Na_2CO_3—90 lb. at $1.80/100 lb.	1.62
Unbleached, screened pulp—2,120 lb. (53% yield)	
Bleaching chemicals	
Cl_2—161 lb. at $2.55/100 lb.	4.11
CaO—42 lb. at $10.00/ton	.21
Na_2SO_3—11 lb. at $2.60/100 lb.	.29
Na_2CO_3—11 lb. at $1.80/100 lb.	.20
Total raw materials	$41.92

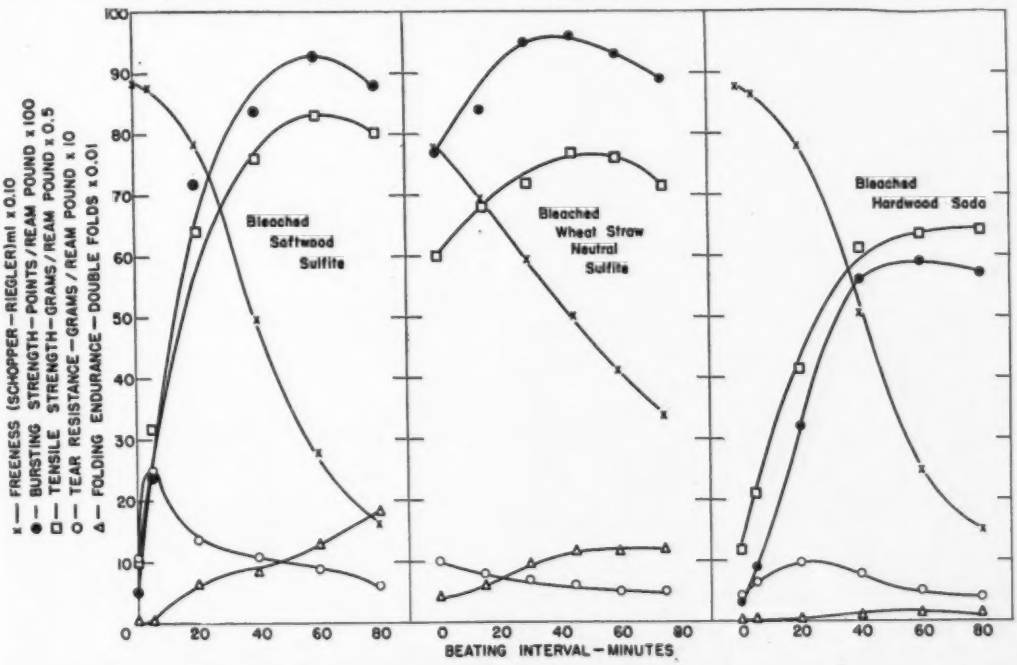
Multiplying the raw material cost by 2 to estimate the approximate cost of the manufactured product gives a value of $83.84 as the manufactured cost of 1 ton of air-dry bleached wheat straw pulp produced by the sodium sulphite process. This figure is not very high, considering the present market price of $125 per ton for bleached hardwood soda pulp and the higher prices obtained for softwood pulps. It is expected that the figure of $14 per ton for straw will be reduced considerably as soon as sufficient equipment for economic collection and baling of straw is available. This will also establish the straw supplies closer to the mill and reduce the cost of transportation. Since the cost of straw represents two-thirds of the total cost of the raw materials in the above calculation, a reduction in the price of straw will materially lower the cost of the pulp.

Sufficient data have been presented to show the technological and economic feasibility of producing high yields of wheat straw pulp for use in the production of fine papers. The essential raw material, straw, is produced annually in abundant supply, and there is no possibility of a scarcity of straw in the foreseeable futures. The next logical step in this development is the making of a mill-scale trial run to determine the optimum conditions for preparing and handling the straw pulp on a production basis. The Northern Laboratory will help in every way possible in making such trial runs.

Summary and Conclusions

The possibilities of straw as a suitable and economical raw material for the manufacture of fine specialty papers are discussed. The neutral sulphite process, producing high yields of easy-bleaching relatively strong pulps from straw was investigated. The effects of sodium sulphite concentration, of added alkali, of time and temperature of cooking, and of bleaching on the yields and on the chemical properties and physical strength characteristics of the resultant pulps were studied.

The results show that yields of 50% of bleached pulp were obtained by cooking wheat straw with 8% sodium sulphite plus 2% sodium carbonate for 2 hours at 170°C. About 5 to 7% total chlorine, based on unbleached pulp, was required to bleach the pulp to a brightness of 70 per cent. The strength properties of the neutral sulphite straw pulp were approximately the same, with the exception of tear resistance, as those of commercial softwood sulphite pulp and much better than those of commercial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□ — TENSILE STRENGTH — GRAMS/REAM POUND x 0.5
○ — TEAR RESISTANCE — GRAMS/REAM POUND x 10
△ — FOLDING ENDURANCE — DOUBLE FOLDS x 0.01
Bleached Softwood Sulfite
Bleached Wheat Straw Neutral Sulfite
Bleached Hardwood Soda
BEATING INTERVAL — MINUTES

FIG. 4
Comparative strength properties of bleached wheat straw neutral sulphite pulp, softwood sulphite pulp, and hardwood soda pulp.

hardwood soda pulp. The possible advantages of blending this pulp with other papermaking pulps for the manufacture of several types of fine specialty papers are discussed. The roughly estimated manufactured cost of the straw pulp; based on raw material costs, is within the range of the cost of competitive wood pulps.

It is concluded from these studies that a pulp suitable for fine specialty papers can be prepared economically from wheat straw by the neutral sulphite process.

Acknowledgment

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TAPPI Notes

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Torsten Hasselstrom, formerly of the U. S. Industrial Chemicals, Inc., is now senior organic chemist with the U. S. Quartermaster Research and Development Laboratories, Philadelphia, Pa.

Howard H. Parker of the Paper Makers Chemical Department, Hercules Powder Company, has been transferred from Kalamazoo to Milwaukee, Wis.

Peter B. Borlew, formerly of the Nekoosa-Edwards Paper Company and the Military Government (U.S.) for Germany, is now technical superintendent of the Container Corporation of America, Fernandina, Fla.

Hugo Klein has resigned as vice president for production and research of Converted Rice, Inc., Houston, Texas.

The dinner speaker at the TAPPI Mechanical Pulping Conference, Poland Spring, Maine, will be Robert E. Canfield, Vice President of the Groundwood Paper Manufacturers Association. His topic will be "Groundwood —the Oldest Wood Pulp and the Newest."

The Tappi Pacific Section will meet at Bellingham, Wash., on September 28th. The subject for discussion will be "Power Plant Engineering."

The TAPPI Chicago Section will meet at the Chicago Bar Association, 29 So. La Salle Street, Chicago, at 6:30 p.m., September 20th. W. F. Gillespie of the Gaylord Container Corporation, Bogalusa, La., will give "A Review of the Development of the Paper Industry in the South."

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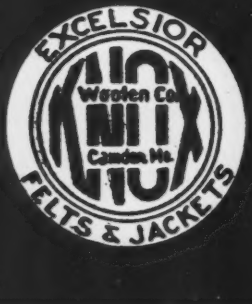

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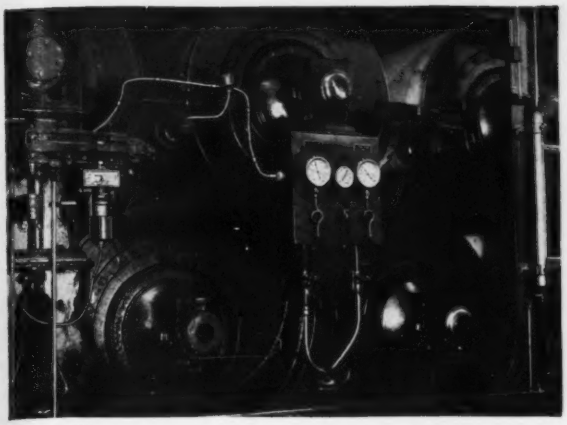

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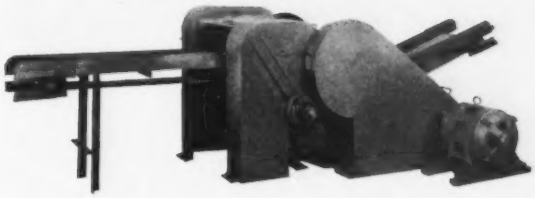

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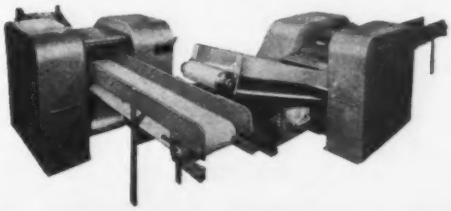

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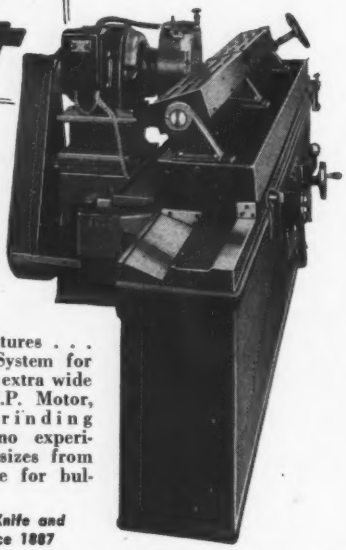

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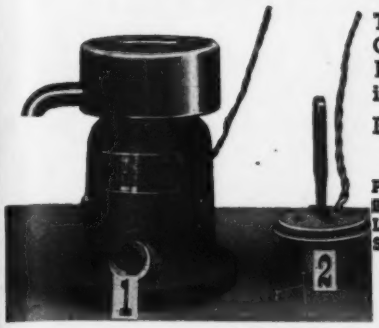
PAPER CHEMICAL DIVISION
7016 EUCLID AVE. CLEVELAND 3, OHIO

Williams High Speed Centrifuge



The Most Rapid Method for the Reduction of Stock to a Definite Moisture Content from which Samples May be Taken for Accurate Freeness Tests. For the Determination of Consistency of Beater and Machine Stock, Fiber in White Water, etc.

Development and Manufacture of Pulp and Paper Testing Instruments for 25 years.

Pulp Testing Ovens	Wood Chip Classifiers	Paper Moisture Testers
Sheet Moulds	Pebble Mills	Freeness Testers
Laboratory Presses	A.S.T.M. Penetration Testers	Laminating and Plastic Moulding Presses
Sheet Dryers	Smoothness Testers	

WILLIAMS APPARATUS CO., Inc.
19 PARK PLACE — WATERTOWN, N. Y.

FINISH MACHINING AND POLISHING WORLD'S LARGEST CENTRIFUGAL BRONZE CASTING.

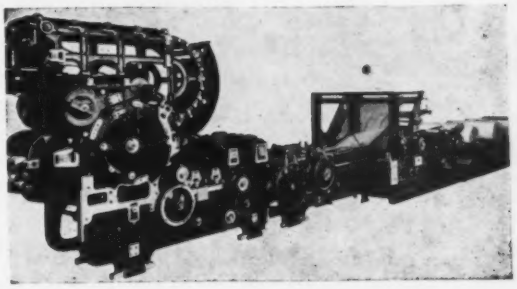
LARGEST YET!

World's largest centrifugal bronze casting—54" O. D. by 328" length.

A close examination of its 14' circumference—at any point along its 27' length—will find it flawless.

Fine grain structure, uniformity, and freedom from porosity characterize *all* our castings. That's why it will pay you, when ordering from your machine builder, to specify Chief Sandusky.

CHIEF SANDUSKY *CENTRIFUGAL CASTINGS*
SANDUSKY FOUNDRY AND MACHINE CO. SANDUSKY, OHIO, U.S.A.

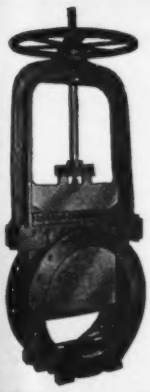


Machine illustrated is a large S.O.S. Multiwall unit capable of making a maximum size bag 19" x 14" x 64".

Weber machines are known throughout the world.

Write in requesting our bulletin describing the complete line of Weber machines.

H. G. WEBER & CO., INC.
KIEL, WIS., U.S.A.



RECORD PAPER & PULP STOCK VALVES "BONNETLESS SELF CLEARING" — — "RESIDUE POCKETLESS TYPE"

METALS — I.B.B.M. all iron, bronze or stainless steels, body parts plain or rubber lined.

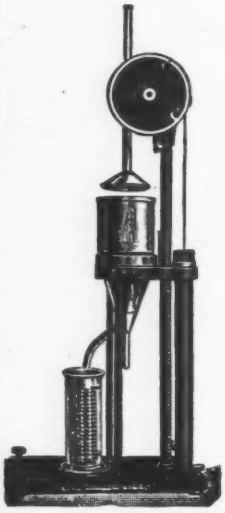
The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.

- The "FAST THREADED" screw stem and ball bearing speeds valve operation.
- The packing box is extra deep, is adjustable and provided with specialized lubricated packings and special type gland and compression bolts.
- The yoke mountings are such that yokes for various methods of gate operation are interchangeable.
- Replaceable gate edge shoes are used in valves 10" and larger. These shoes are of special value when valves are installed stem and pipe horizontal.

"RECORD PRODUCTS EXTENSIVELY USED IN DEFENSE PROJECTS."

RECORD FOUNDRY & MACHINE COMPANY
LIVERMORE FALLS, MAINE, U. S. A.

T. M. I. QUALITY CONTROL



Fully Automatic Schopper Riegler Type Freeness Tester Eliminates Human Error

ALL TESTERS FOR PULP & PAPER INDUSTRY

MULLEN-
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STIFFNESS
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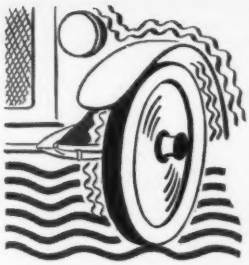
SCHOPPER TYPE
TENSILE
FREENESS
FOLDING
HINDE & DAUCH CRUSH

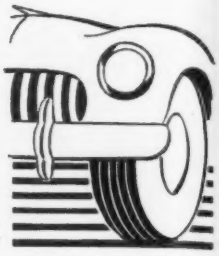
T.M.I.—MICROMETERS—SCALES

TESTING MACHINES Inc.
429 W. 42nd St., New York 18, N. Y.

Old Inaccurate Scales, Micrometers and other testers recalibrated and made over like new.



TIRE COMFORT



...and, over the years, progress in the making of Fourdrinier wires and paper has been just as great.

The packing for shipment of Fourdrinier wires at Lindsay is much more important than it sounds — a very painstaking operation.

THE LINDSAY WIRE WEAVING COMPANY
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Lindsay WIRES
FOR PAPER MILLS

GUIDE YOUR WEB

TO AN EVEN ROLL WITH THE
MECHO AIR GUIDER

Economical — Simple — Efficient

BOUND BROOK ENGINEERING CO.
108 Hamilton Street
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From tissue to heavy board, narrow to wide cuts, small to large diameters — there's a type and size for every job.

SAMUEL M. LANGSTON COMPANY, CAMDEN, N. J.

A LINE OF CONVERTING MACHINES YOU CAN DEPEND ON . .

ROTARY FOLDERS
Paper Towel [1]
Toilet Tissue [2]
Facial Tissue
Paper Napkin [3]
Wax Paper
Paper Table Cover

WINDERS
Paper Towel
Toilet Tissue
Drum Winders
Crepe Paper
Jumbo Roll
Friction Winders

PRINTING PRESSES
Multi-Color Rotary Web
Multi-Color Rotary Sheet
Oil Ink
Aniline Ink
Arc Type
In Series Type

WEB EMBOSSERS
Glassine
Board
Towel
Tissue
Napkin
Wrapping
Name
Book and Writing
Special Purpose

BUNDLING PRESSES
Adjustable
Tissue
Napkin
Multi-Wall Bag

CREPE MACHINES
Tissue
Waterproof
Kraft

MISCELLANEOUS
Toilet Roll Wrappers
Seat Cover Machines
Spiral Core Machines
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1—All various types of folds. 2—All various folds. 3—A wide variety of folds.

Write for complete details on any machine in which you may be interested.

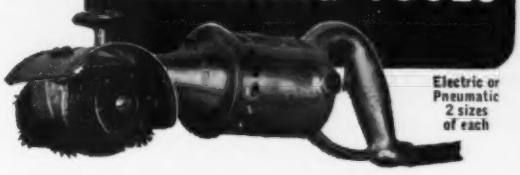
SIMPLICITY THE KEYNOTE OF OUR MACHINE DESIGN

PAPER CONVERTING MACHINE CO. GREEN BAY WISCONSIN

Remove SCALE, PAINT, RUST Quickly . . . Easily

USE AURAND CLEANING TOOLS

For any hard metal or stone surface — iron — steel — brick —concrete—etc.

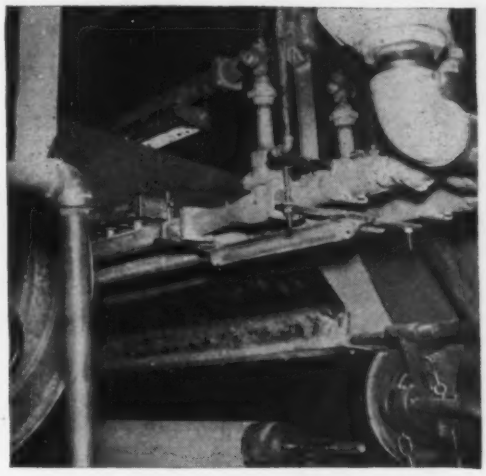


Electric or Pneumatic 2 sizes of each

It's easy to remove paint, scale, rust and other accumulations with AURAND Cleaning Tools. Powered, rotary chipping does a thorough cleaning job in less time. No special skill required. Even depth surface is assured by an adjustable shoe control. Cutter heads are renewable.

For further information, address Dept. 38

AURAND MFG. & EQUIP. CO.
2643 Colerain Avenue • CINCINNATI, OHIO



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FOR THE PAPER INDUSTRY

Increase your drying capacity with Red-Ray Radiant Gas Burners—they are efficient, economical and thoroughly practical. Easily installed. Require no additional space. Electrically controlled. Maximum flexibility.

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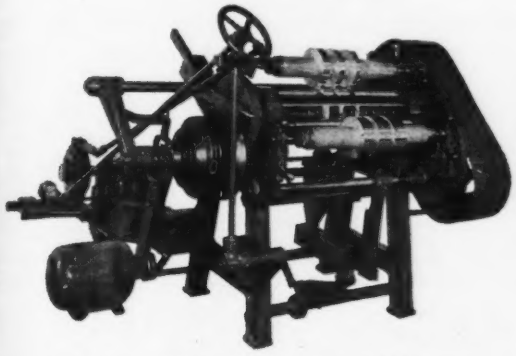
RED-RAY MANUFACTURING CO., INC.
455 West 45th Street New York 19, N. Y.

GOOD DELIVERY — MODERATE PRICED
PRECISION BUILT
SLIT-MASTER

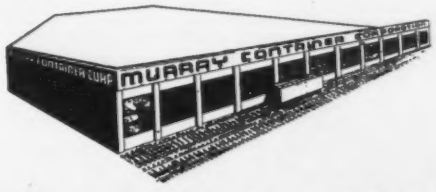


Duplex Slitters & Re-winders
IN 4 SIZES
24"—36"—42"—52" WEB WIDTH
Designed for Slitting Cellophane—Foil and Acetate Stock

WRITE FOR COMPLETE DETAILS

SUBURBAN MACHINE COMPANY
Designers & Builders
Special Paper Converting Machinery
CINCINNATI — 11 — OHIO

FOR
CORRUGATED BOXES
IT'S
MURRAY
A GREAT NEW NAME IN
DEPENDABLE PACKAGING



Murray Container Corporation's newly-opened Philadelphia plant, complete with the most modern equipment available now offers the finest in corrugated solid fibre boxes and sheets, cloated fibre boxes, and die-cut specialties. We can help you toward greater economy and efficiency. Your inquiry will bring a prompt and detailed response and quotations.

MURRAY CONTAINER CORP.
23rd & WASHINGTON AVE., PHILA. 46, PA.

For Pulp and Paper Mill Stock and White Water Lines

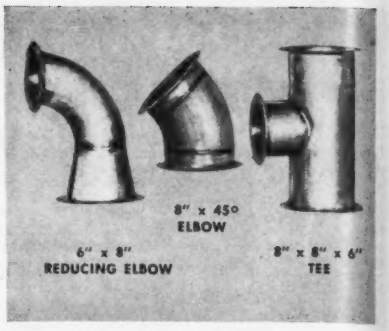
Phoenix *Smoothflow*

STAINLESS STEEL ELBOWS

Designed for Stainless Steel and Transite Pipe

LIGHT in weight, simple to install, with smooth inside curvatures, SMOOTHFLOW Elbows are stocked in 4", 6", 8", 10" and 12" sizes. Standard vanstone flanges, split type, cast iron back-up flanges with standard bolt holes. Tees, reducers, special fittings, made to special order.

WRITE for illustrated folder and dimension data.



PHOENIX PRODUCTS CO., *Metal Spinning Division*

4721 N. 27th STREET MILWAUKEE 9, WISCONSIN

COLORS

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Board and *Paper*

Green

CHROMIUM OXIDES

Black Brown Red Yellow

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C. K. WILLIAMS & CO.

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For The Paper Industry

A Partial Listing From Chicago Electric's Large Quality Stocks

TWO COMPLETE VARIABLE VOLTAGE DRIVES

MOTOR GENERATOR SET

200 KW DC generator, General Electric, type MPC, 250 volt, 800 amp, 1200 RPM, direct connected to, Synchronous Motor.

300 HP General Electric, type TS, 3 ph, 60 cy, 440 volt, .8 P.F. 1200 RPM.

D.C. MOTOR

250 HP General Electric, type MPC, form A, 245 volt, 730/975 RPM. With complete starting and control panels.

REBUILDERS, ENGINEERS AND DISTRIBUTORS OF FINE POWER EQUIPMENT SINCE 1910

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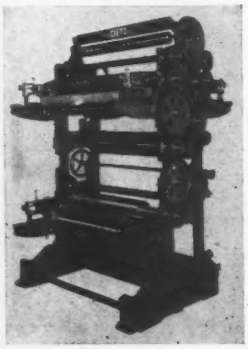
CHICAGO ELECTRIC COMPANY

1325 WEST CERMAK ROAD **CHICAGO 8, ILL.**

Canal 2900



ROTARY ANILINE PRINTERS

SINGLE & MULTI COLOR

Slitters and Rewinders for Vulcanized Fibre and Heavy Board

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Towel Interfolders for single interfold

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Special Machinery

Rotary Card Cutters

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Spiral Tube Machines for Toilet Roll Cores

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Designing

DIETZ MACHINE WORKS

Factory-Office: 126 W. Fontaine St.

SINCE 1901 **PHILADELPHIA 22, PA., U. S. A.**

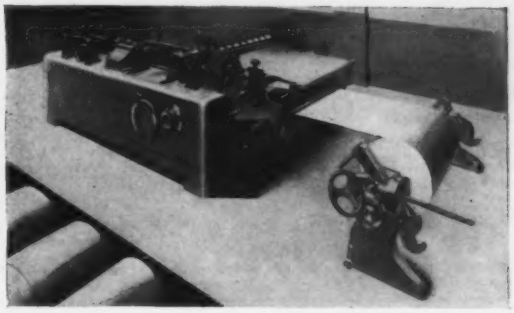
Photo, Courtesy J. M. Huber Corporation

Single Instrument Measures Smoothness Porosity and Softness of Paper

You just interchange the lower test plates in the GURLEY-HILL S-P-S Tester to convert it into an instrument for testing either smoothness, porosity or softness of any type of paper, by measuring a given air-leakage over or through the paper.

This 3 in 1 laboratory "assistant" is simple to operate, quick and accurate and a real utility instrument where printing quality of paper must be reliably measured.

Bulletin No. 1400 describes the S-P-S Tester as well as other Gurley paper testing instruments. It's worth writing for today. W. & L. E. Gurley, 520 Fulton St., Troy, New York.



AUTOMATIC CONVOLUTE TUBE WINDER

Built in Five Sizes

3/16" to 4½" diameter from 6" to 66" long.

Paper Web width 6" to 66".

MACHINERY AND PRODUCTS ENGINEERING CORPORATION

Spiral and Automatic Convolute Tube Winders	Automatically Feeding and Ejecting Tube Cutters
Paper Can Machinery	Automatic Spool Machines
Cut-Off Saws	Perforators
Gluers	Sheeters
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3632 FRANKFORD AVE., PHILADELPHIA 34, PENNSYLVANIA

Price & Pierce ltd Pulp & Paper agents

60 E.42 ST. N.Y. 17.

HOLES

The "Nothing" That is Important to Screens and Filters

H&K PERFORATED METALS

Perforations are the key to the successful operation of your screens and filters. And with **H & K Perforated Metals** you can be sure those holes are right . . and in the right materials.

Precision-made, durable, economical—with a minimum of wear, stress and corrosion . . . That's your assurance with **H & K Perforated.** Whether it's Stainless Steel, Monel, Inconel — Plastics, Fabrikoids, Rubber, Plywood — or other sheet and plate material, there's an experience record of 65 years to back up the job. A wide range of sizes, shapes and spacings too.

Consult H & K first on all your screen, filter, grille and other perforating needs if you really want trouble-free results.

The Harrington & King PERFORATING Co.

5652 Fillmore St., Chicago 44, Ill.
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CLEARING HOUSE

HELP WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

SITUATIONS WANTED—10c a word, double rate for heavy face type. Minimum charge $2.50. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—10c a word. Double rate for heavy face type. Minimum charge $2.50.

WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

OPPORTUNITIES—10c a word. Double rate for heavy face type. Minimum charge $2.50.

Classified advertising space may also be purchased at $5.00 per single column inch. All classified advertisements are payable in advance. If box number is used—70 cents additional.

Address replies to advertisements appearing under Box Numbers in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 19, N. Y.

HELP WANTED

MEN WANTED
Positions Open

Several Superintendents—one for bonds, ledgers and chemical pulp papers, preferably technically trained man; superintendent for mill in Canada on sulphite bonds, waxing, specialties, kraft and bag stock, etc., Fourdrinier machines; another superintendent for Cylinder machine mill on paper boards; superintendent for newsprint and sulphite mill.

Manager for Cylinder asphalt roofing and roofing felt mill; purchasing agent who has had actual experience in purchasing for pulp and paper mills in Canada.

Several Plant Engineers and Master Mechanics

Salesman well acquainted with mills in Maine and N. H.; salesman to sell pulp and paper mill machinery; chemical salesman with technical education and at least three years selling experience calling on paper processors.

Tour bosses for Cylinder and Fourdrinier machines; machine tenders, back tenders and beater engineers; qualified instrument mechanic; draftsmen and designers.

We invite correspondence (confidential) with mills seeking executives and with executives seeking new positions.

Charles P. Raymond Service, Inc.
274 Washington St., Boston, Mass.

WANTED

Man for sales and service with broad knowledge of refining principles and paper mill operation. Must be willing to travel extensively. College education desirable. Starting salary attractive. Address Box 48-582, care Paper Trade Journal. S-9

RESEARCH CHEMIST wanted in mill manufacturing latex impregnated papers. Experience in latex compounding or paper impregnation is essential. Only top quality applicants will be considered. State qualifications and minimum salary acceptable. Address Box 48-532 care Paper Trade Journal. S-9

SOUTH AMERICA—Wanted man under 35, college graduate, to oversee and control operations and to assist in development of new converting lines for small plant in Peru making Kraft bags and corugated containers—give training, experience and family status. Address Box 48-546 care Paper Trade Journal. S-9

CONVERTED PAPER SALESMAN—Eastern converter of Creped and Waterproof Papers and bags has position in New England Territory for experienced salesman to handle their line. Must reside in New England. Address Box 48-467 care Paper Trade Journal. S-9

HELP WANTED

MECHANICAL PULP MILL SUPERVISOR

A leading book paper manufacturer in the East is desirous of employing a technically trained operator to supervise the design and operation of a mechanical pulp mill to be used as a development operation in the use of a variety of woods, including hardwoods, for high grade book and magazine papers. Responses should be accompanied by full information regarding age, training, experience, and special qualifications, and should state salary required and earliest date upon which applicant is available for interview and employment. Reply box number 48-564, care Paper Trade Journal. S-9

SALARIED POSITIONS $3,500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (38 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Dun Bldg., Buffalo 2, N. Y.
TF

Salesmen to represent AAA1 manufacturer of toilet tissue, paper towels and napkins. Salary plus expense allowance. This is an excellent opportunity for men with sales experience, preferably in paper trade, who can qualify to act as responsible territory managers. Write us about your experience and qualifications—including present earnings and salary requirements. Address Box No. 48-561, c/o Paper Trade Journal. S-9

MACHINERY SALESMEN

Men with experience in the paper industry preferred. One man for the middle west and one to cover the Eastern territory. To sell DynoPulpers, DynoFiners and Dyno-Chests. We offer an exceptional salary, plus bonus on sales. Kurt Wandel Industries, Inc. Honey Brook, Penna. S-9

WANTED

Experienced paper mill engineer for design and layout work on fourdrinier and cylinder machines and other paper mill machinery. Please give full details of experience, education, qualifications and salary desired. Salary will be based on experience and ability of applicant.
Reply to Box #48-560 care Paper Trade Journal. S-9

HELP WANTED

WANTED — Engineer-draftsman for West Coast Pulp and Paper Mill. Must have experience in construction and maintenance. Good salary to right man. Please write giving full particulars as to experience and education. Address Box 48-541 care Paper Trade Journal. TF

SOUTH AMERICA — First Class Machine Tender under 35 wanted for mill in Peru—should have cylinder as well as Fourdrinier machine experience but not required. Good opportunity for advancement—give experience and family status. Address Box 48-545 care Paper Trade Journal. S-9

WANTED — Superintendent for converting plant manufacturing napkins, toilet tissue. Send references when applying. Address Box 48-554 care Paper Trade Journal. S-9

DEVELOPMENT ENGINEER—To specialize in new line of equipment for paper mills. Young ambitious college graduate preferred. Part time travel required. Address Box 48-555 care Paper Trade Journal. S-9

WANTED:—Beater Engineer in three machine mill located about (50) miles from New York. Running on white and colors, light weight Tissue. Apply Box 48-568 care Paper Trade Journal. S-16

WANTED—Experienced cylinder machine tender for machine making .016 test linerboard. Will pay top wages for good man. Address Replies to the Prairie State Paper Mills, Middletown, Ohio. S-30

OPERATOR—for roll toilet converting machine. Experience essential. Plant in Brooklyn, N. Y. Excellent opportunity. Address Box 48-580 care Paper Trade Journal. S-9

PLANT VICINITY LOS ANGELES, California, one unit operation, desires corrugated plant superintendent. Man must be thoroughly experienced. State full qualifications and experience in first letter. All replies will be treated as confidential. Address Box 48-576 care Paper Trade Journal. S-9

SITUATIONS WANTED

PAPER BAGS & SPECIALTIES

Plant Supt., with wide experience in the manufacture of all types of bags, from heavy duty down to cellulose tissues, wishes to become associated with a progressive organization. Am especially interested in an organization who is in need of the mechanical development of their ideas.

Experience engenders the mechanical operation of all types of printing, embossing, slitting machinery, as well as the latest type printing and bag making equipment. Have been in complete charge of manufacturing, mechanical development, and personnel for many years. Have designed and supervised construction of many special machines, and improvements to troublesome equipment.

Address Box 48-550 care Paper Trade Journal. S-16

SETTLING TROUGHS D-S PUMPS HYDRAPULPERS BEATERS PASTERS
BEATERS TRIM CUTTERS SPECIAL PROCESSES WATER FINISHERS BOOSTER PUMPS
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SELECTIFIER SCREENS HYDRONAMIC INLET SIZE PRESSES HYDRAPULPERS
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STUFF CHESTS FORMATION TABLES JORDANS
COUNTER-REVERSE DRIVES INDENTING MACHINES WAXING MACHINES SLITTERS
JORDANS REELS
B-C SHAKE PARAFFINE SATURATING SEAMLESS DRYERS INCHING DRIVES SELECTRAPS
D-V PUMPS

EVERYTHING

SETTLING SYSTEMS WASTE PAPER SYSTEMS

FOR THE

D-S PUMPS HEAVY-DUTY CUTTERS

PAPER MILL

"EVERYTHING FOR THE PAPER MILL"—and on that we take our stand.

Because *"Everything for the Paper Mill"* is not just a slogan or trite assembly of high-sounding words, but susceptible of definite proof, the mills should be interested.

The mills should be interested because the ability to engineer and build so varied a line of preparation, forming and converting equipment implies very broad experience in mill problems—***75 YEARS' EXPERIENCE***, to be exact. That experience can and often does prove invaluable, regardless of speeds, tonnages, grades or physical mill layouts.

They should be interested because the supplier who thoroughly understands both preparation and forming has a better opportunity to see the mill's requirements as a whole and engineer the program accordingly. Believe us, gentlemen, there is more to this than meets the naked eye.

Finally, mills should be interested in the ability of Black-Clawson to engineer and build "Everything for the Paper Mill" because, when you commission such a supplier to engineer and build your mill, you center all responsibility for its smooth and efficient operation at one point. That, too, can be extremely important.

THE BLACK-CLAWSON COMPANY, Hamilton, Ohio

Divisions: SHARTLE BROS. MACHINE CO., Middletown, Ohio
DILTS MACHINE WORKS, Fulton, New York
THE BLACK-CLAWSON CO. (England) LTD., Morden, England
Associate: Alexander Fleck Limited, Ottawa, Ontario, Canada

SITUATIONS WANTED

WAX CHEMIST

experienced in analysis, research formulation of industrial waxblends for coating, laminating etc. offers his consulting services.

Kroner Laboratories
275 Water St., New York City
S-9

Chemical Engineer with thirteen years bread experience in technical and operating control in manufacture of groundwood sulphite and kraft pulps, papers and boards. Thorough practical knowledge all phases operations gained in responsible positions. Seeking change interested in operating, technical or advisory position. Box 48-579 care Paper Trade Journal. S-23

SUPERINTENDENT of felt mill wants to make a change. Now employed. Address Box 48-581 care Paper Trade Journal. S-23

SITUATIONS WANTED

PLANT MANAGER—Thorough experience in converting paper and boards; wants change to position offering better opportunity. Excellent production and labor relations background. Address Box 48-97 care Paper Trade Journal. S-30

MAN WITH BROAD EXPERIENCE and contacts in pulp, paper, chemical cellulose and synthetics wishes to locate in New England, New York State, Mid-West or West Coast. Qualified for administration or for responsible work in manufacturing research, engineering development, production or sales service. Address Box 48-556 care Paper Trade Journal. S-16

BEATER ENGINEER with 45 years experience on most all kinds of paper, wishes position in North West States. Address Box 48-557 care Paper Trade Journal. S-9

COMPTROLLER—Now employed, seeks new connection in paper, printing or publishing fields. 20 years diversified experience. Personable and aggressive. Age 46. Available upon two weeks notice. Address Box 48-575 care Paper Trade Journal. S-16

SITUATIONS WANTED

EXPERIENCED PERSONNEL MANAGER —38 years old, desires to make change—Excellent experience in union and non-union mills in all phases of personnel and public relations. Minimum salary $8,000. Address Box 48-585 care Paper Trade Journal. S-30

PLANT MANAGER — Graduate Mechanical Engineer thoroughly familiar with all paper mill equipment, knowledge of paper making on high speed tissue machine, all types of converting, packaging, material handling and managerial experience including personnel, purchasing, etc. Address Box 48-583 care Paper Trade Journal. S-30

MARKET DEVELOPMENT: Young chemist presently employed in sales service development of industrial adhesives, desires change to market development. Graduate training in all phases of marketing and statistics. Experience includes paper chemistry, printing inks and industrial adhesives. Address Box 48-569 care Paper Trade Journal. S-16

FOR SALE

BARKERS
1—5' Carthage Disc Barker

BEATERS
3—1000 lb. Dilts Beaters—Iron Tub.
1—300 lb. Beater—iron tub.

BRASS FELT ROLLS
9—4" diameter x 140" face (with bearings).

BREAST ROLLS
1—100" x 14".
3—114" x 14".
1—120" x 14".

CRUSHERS
1—18" x 18" Jeffrey Single Roll Crusher.

CYLINDER MOULDS
1—36" diameter x 80" face.
3—30" diameter x 72" face.
1—36" diameter x 79" face.
2—42" diameter x 88" face.

DECKER
1—Decker—48" diameter x 84" cylinder mold (New).

DRIVES
1—#4 Reeves Drive.
1—#2 Reeves Drive.
1—Cleveland Worm Drive. Ratio 10 to 1.
1—Smith & Winchester mortise gear Drive.
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1, 900 RPM.
3—Foote—7½ h.p. Speed Reducer (Ratio 740 to 1)
2—Smith & Winchester Mortise Gear Drives with 26" diameter clutches—Ratio 8 to 1.

DRIVES (Angle)
1—General Machine Company 16 : 1.
1—Philadelphia 50:1—1 h.p.—1200 r.p.m.
3—Philadelphia 21¼:1—3 h.p.—1200 r.p.m.

DRYER FRAMES
Frames for 47 dryers, 36" dia., 2 deck.

V-BELT DRIVE
1—81¾" diameter x 7¾" face, 5 groove.
1—16½" diameter x 7¾" face, 5 groove. (With clutch).

DRYERS
9—36" diameter x 76" face.
1—48" diameter x 60" face with bearings.
1—48" diameter x 91" face.
1—48" diameter x 94" face.
3—25" x 120"(Baby Dryers).
1—48" x 100".
2—36" x 143".
1—24" x 130".

FLAT SCREENS
2—12 Plate Murray Dunbar Flat Screens.
2—12 plate Impco Flat Screens.
1—12 plate Baker Flat Screen.
1—8 plate Packer Type Flat Screen.
1—6 plate Shartle Flat Screen.

FORK TRUCK
1—Lewis Shepard Fork Truck (Height of lift 109", capacity 3000 lbs.)

HYDRAULIC PRESS
1—Watson-Stillman Co. (Platen 24" x 24").

JORDANS
1—Noble & Wood, Pony Monarch, Belt Driven.
2—Noble and Wood—Mammoth Type.

MISCELLANEOUS
1—Caustic Mixer.

PRESS ROLLS
Various sizes.

PULLEYS
Various cone and assorted pulleys.

PULP STACKER
1—Link Belt Company Pulp Stacker, 30 ft conveyor, 2½ ft. wide, self propelled, with motors.

PULPER
1—E. D. Jones Pulper—#41—Complete, including motor and starting equipment.
1—Jones Pulper.

PULVERIZER
1—Erie coal pulverizer.

PUMPS
1—Buffalo Pump—5500 g.p.m. (50' head).
2—Goulds—2 stage—420 g.p.m.—1010' head
1—Weil Pump Co.—100 g.p.m.—100 P.S.I including 15 h.p. motors (new equipment).
1—Bell & Gossett—300 g.p.m.—120' head—including 15 h.p. motor.
1—Goulds Sump Pump—50 g.p.m.—20' head—including motor.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

ROLLS
500—Brass tube-steel tube—rubber covered iron rolls—various sizes.

SCREEN PLATES
20 Plates cut .016.
10 Plates cut .008.
Also other sizes and cuts in stock

SHEETERS
1—136" Moore & White Sheeter, duplex, with layboy.
1—45" Beck Sheeter.

SHREDDERS
1—Gilman Shredder.

SLITTERS AND WINDERS
1—42" Cameron—Type 28-8-7 (shear cut).
1—72" Cameron—Type 28-8-7-D (shear cut).
1—42" Cameron—Type 40-4-B.
1—42" Cameron—Type 24-2A.
1—50" Cameron—Type 24-2L.
1—42" Cameron—Type 9-S.
1—56" Cameron—Type 24-2A.
1—30" Langston.
1—36" Beck Razor Blade type Slitter & Winder.
1—42" Cameron Constant Tension, with pneumatic control.

STOCK PUMPS
1—10 x 20 Shartle Duplex.
4—7 x 16 Shartle Duplex.
Numerous other Centrifugal Stock Pumps Advise as to your requirements.

SUCTION PRESS ROLLS
1—Downingtown Suction Press Roll 18" diameter x 66" drilled face.

SUCTION FELT ROLL
1—Nash 110" Suction Felt Roll.

SUCTION ROLL
1—Downingtown 16" diameter x 87" drilled face.

TRIMMER
1—56" Smith & Winchester—Undercut.

TURBINE
1—150 h.p. Westinghouse Type C-Gear Turbine (Recently rebuilt).

VACUUM PUMPS
1—26 Nash Hytor vacuum pump.
1—Sandusky 8 x 10.

YANKEE DRYERS
2—8' diameter x 175" face.

We are always in the market to purchase your surplus or idle machinery. What have you to offer? Wanted Cylinder and Fourdrinier Machines (complete mills).

Paddy Ross, Pres. **J. J. ROSS COMPANY** Ben Kurs, Treas.
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265 PASSAIC STREET
NEWARK 4, N. J.

CONVERTING
PAPER MAKING EQUIPMENT

NEW, USED, REBUILT
PAPER AND PULP MACHINERY

BEATERS

2—750 lb. Horse Iron Tub. Roll 60"x40"
1—1200 lb. Noble and Wood—no tub. Spare new fillings for roll.
4—Valley Iron 750 lb. Iron Tub—Bronze filled.
1—Valley Iron 2000#. No tub.

BLOWERS

1—American Sirocc Size 4.
2—American Blowers #300.
1—American Blower #700.
—American Blower #750
3—Buffalo Forge Co. #24 Cast Iron Blowers

CALENDER ROLLS

4—138" face x 12" diameter
1—129" face x 15¾" diameter
1—104" face x 19" diameter
40 other rolls—all sizes.

CALENDER STACKS

1—64" Pusey & Jones—9 roll.
1—Lobdell 70" 10 roll Calender Stack—water cooled bearings—complete with drives.

COATERS

6—56", 66", 79" Waldron Brush Coaters—complete with drying systems and winder.

CONVERTING EQUIPMENT

1—45" Hudson Sharp Facial Tissue converter—with embossing attashment.

CONVEYOR

1—18½ ft. long x 30 ft. wide—with motor.

COUCH ROLLS—BRASS

1—19½" diameter x 94" face
2—20" diameter x 92" face
1—18" diameter x 90" face
1—24" diameter x 94" face
1—104" face x 18" dia.
1—102" face x 18" dia.
1—118" face x 16" dia.
1—150" face x 16" dia.

COUCH ROLLS—RUBBER

1—110" face x 20" dia.—New.
1—139" face x 19" dia.
1—110" face x 17" dia.
1—141" face x 21" dia.

CYLINDER MOLDS

4—IMPCO 40" diameter x 84" face.
2—36" diameter x 138" face Cylinder molds with vats, couches—ball bearing.
4—74" face x 36" diameter.
1—134" face x 36" diameter.
1—79" face x 36" diameter.

CYLINDERS AND VATS

2—136" face x 36" dia.—with vats, couch, complete.

DRYERS

4—74" face x 28" diameter with gears.
5—143" face x 48" diameter.
3—141" face x 48" diameter Cropsing Dryers—ball bearing.
6—134" face x 48" diameter.
1—134" face x 36" diameter.
6—80" face x 36" diameter.

ELECTRIC DRIVE

1—General Electric 180 h.p. paper machine. Motor drive, complete controls for M. G. set and paper machine drive. Varying voltage control.

EMBOSSER

1—Waldron 40"—ball bearing—complete.

EXTRACTOR ROLLS

1—Downingtown—64" face x 17" diameter.

FLAT SCREENS

4—8 plate Sandy Hill Flat Screens
3—10 plate Sandy Hill.
1—Ball Bearing 8 plate Flat Screen.
1—Sandy Hill 8 plate—with scraper.

FOURDRINIER SECTIONS

1—B & C 129" x 69" wire. Ball bearing with mahogany head box. Bertram inlet and breast roll.
1—P & J 158" x 80 ft. ball bearing. Complete from inlet to 22" diameter suction couch. Brass and Rubber covered table rolls. 6 Brass Suction Boxes operated at 1000' per minute.

HAMMERMILLS

1—American Hammermill—87" anti friction bearing equipped.

HEAD BOXES

1—118" Bronze Lead Lined. Besolt.

HOG

1—Mitts & Merrill Hog. 12" x 12"
1—Fitchburg 7 x 9. Ball bearing.
1—Mitts & Merrill.

INLETS

1—112" Voith Inlet.
1—128" Bertram Inlet and Flow box.

JORDANS

1—Dillon #2—50 ton capacity.
1—#1 Appleton—ball bearing with extended base for motor.
1—Jones Standard—ball bearing direct connected to 150 h.p. G.E. 440 volt motor.
1—#3 Miami, for motor drive.
1—Jones Standard for V-Belt Drive.
1—Jones Majestic anti friction bearing—bronze filling—for motor drive.
4—Jones Majestics with base and couplings—bronze filled, 2 sets of new bronze fillings.
2—#3 Appleton with base and coupling—bronze filled.
1—Jones #0 ball bearing high speed—2 spare new shell stainless steel fillings.
1—Dillon Horse #2—direct connected 75 h.p. Stainless steel ½" filling.
1—#4 Smith & Winchester—Ball bearing.

LABORATORY EQUIPMENT

1—12" 6 roll calender stack with Westinghouse 7½ h.p. motor.
1—New E. D. Jones 17# iron tub beaters, stainless steel fillings.

MOTORS

1—Fairbanks Morse — 30 h.p. — 495 r.p.m. — 220/440/550.

PRESS ROLLS

1—110" face x 15" diameter—rubber.
1—101" face x 16½" diameter—rubber.
1—123½" face x 17½" diameter—rubber.
1—112" face x 15" diameter—rubber.
1—127" face x 17½" diameter—brass.
1—117" face x 24" dia.—Brass.
1—84" face x 20" dia.—Rubber.
1—176" face x 22" dia.—Rubber.
2—118" face x 21" dia.—Rubber.
2—87" face x 15" dia.—Ceres.
1—180" face x 14¼" dia.—Rubber.
3—147" face x 11¾" dia.—Rubber.

PRESS SECTIONS

3—Sets Primary Presses 136" face x 14" diameter with frames.

PULP EQUIPMENT

1—Jigger—1 desk—vibrating screen.
1—Mitts & Merrill #17 Pulpwood chipper
1—5' Carthage Disc Barker
1—88" Carthage Ball Bearing Chipper—4 knife.

PULPERS

1—Bird Pulper
2—#2 Lamson Pulpers.

PUMPS

1—Worthington Monoblock—250 g.p.m.—130' head—direct connected to 15 h.p.—3500 r.p.m.—220/440 volts, totally enclosed. ball bearing motor.
1—New Goulds Pump—75 g.p.m.—70' head—2 x 1½—for motor drive.
2—New Goulds Pumps—150 g.p.m.—90' head—3 x 2—for motor drive.
1—New Goulds Pump—500 g.p.m.—60' head—6 x 4—for motor drive.
1—Ingersoll Rand—50 g.p.m.—210' head—direct connected 7½ h.p.—220-440 volt—3 phase—60 cycle totally enclosed motor.
1—New Warren—all bronze, 30 g.p.m.—60' head—connected to 1½ h.p.—440 volt motor.
2—Ingersoll Rand 150 g.p.m.—75' head—connected to 5 h.p. motor—220/440 volt motor.
1—Worthington—2000 g.p.m.—250' head.
1—Worthington 3 x 4—300 g.p.m. 75' head—1750 r.p.m. Ball bearing for motor drive.
1—Trench Marine ball bearing. 500 g.p.m.—600' head.

PUMPS—OPEN IMPELLER

1—Morris open impeller—8" suction—5" discharge—belt driven.
1—Frederick fully open impeller—1550 g.p.m., 61' head—12" suction—8" discharge—belt driven.
1—Frederick 2000 g.p.m. 50' head, 12" suction x 10" discharge. Belt driven.
1—Open Impeller—Bronze—1000 g.p.m., 80' head—with extended base and couplings. Ball bearing.
1—Morris Vertical Open Impeller 6 x 6—300 g.p.m. 3 percent stock—40' head—connected to G.E. 15 h. p. 220-440 volt 3 phase—60 cycle—1185 r.p.m.
1—Frederick Open Impeller—4 x 10 for motor drive. No base.
5—New Goulds—ball bearing—6" suction—4" discharge—1100 g.p.m.—50' head. Requires 20 h.p. at 1750 r.p.m.
5—New Goulds—ball bearing—8" suction—6" discharge—1800 g.p.m.—40 head. Requires 25 h.p. at 1150 r.p.m.

REELS

2—Beloit 110" two bowl Reel.
1—84" Moore & White—2 bowl reel.

ROTARY KNIFE CUTTERS

3—Sprout Waldron Cutters Type F-11. 30" knives—used 30 days.

REDUCERS

1—Jones Worm MAAG Vertical Reducer. Ratio 248 to 1. Serial #205661.
1—De Laval Parallel—68 h.p.—ratio 2.24 to 1.
1—Cleveland 1 h.p. Size 30-A-T. Ratio 40 to 1. with starter and automatic control.
1—Falk 5 h.p. 11.9 - 1

REFINERS

1—Jones high Speed Refiner—with ball bearings and 2 spare new shell stainless steel fillings

ROLLS

75—Steel—160" face x 9" diameter.
200 Assorted felt carrying.
50—Brass Chromium Plated. Ball Bearing. 60" Base x 12" Diameter
50—Steel 9" diameter x 84" to 100" face.
40—Brass 5" diameter x 128" face—with ball bearings.
42—Steel 101" face x 7" diameter.

ROTARY SCREENS

2—Leithwaik Rotary Screens.
2—Jones Leithwaik—cylinder 84" face x 28" diameter.
1—#2 Bird Rotary

SCREW PRESSES

2—Valley Voith Screw Presses Size 2A, with new spare sets of plates.

SHEETERS

1—90" Finlay 12 roll backstand with layboy. Two Pile.
1—136" Hamblet Duplex.
1—122" Dilles Duplex Sheeter. Heavy Duty.
1—Hamblet 130" heavy duty—with 12 roll backstand and layboy.

SHREDDERS

1—Rythor and Primle Shredder.
3—Sprout Waldron Cutters — type F-11 — 30" knives. Used 30 days.

SLITTERS AND WINDERS

1—40" Kidder Slitter and Rewinder.
2—Pusey & Jones 164" high speed slitters and rewinders.
1—Cameron 56"—Model 16.

STUFF PUMPS

1—Beloit 10 x 20 triplex—with motors and chain drives.
1—Shartle 8 x 18 Triplex.
1—Shartle 7 x 16 Triplex.

SUCTION COUCH ROLLS

1—Millspaugh 22" diameter x 138¾" suction face.
1—Millspaugh 25" diameter x 178" suction face Roller Bearing.

SUCTION PRESS ROLLS

1—Beloit 187" drilled face x 22" dia.—anti friction bearings.

TRIMMERS

1—56" Undercut Trimmer.
—?" Dewees
2—Seybold 64" with motors.

VACUUM PUMPS

4—H-G Nash—used 6 months.
1— 4 Nash Hytor.
1—Nash—MD 823.
2—Nash—#2H.
1—Nash L2.

WET MACHINES

2—Union Iron Works wet machines, cylinder mold 36" x 74"—Complete No Vats
1—Union Iron Works—cylinder 38" dia. x 74" face.

AMERICA'S LARGEST BUYERS OF PAPER MAKING MACHINERY

FOR SALE

1—82" Hamblet Sheeter
1—62" Cameron Winder
1—Noble and Wood Iron Tub Fast Circulating Breaker Beater 1500 Lbs. capacity, 62" Dia., 54" Face
1—Sandy Hill Centrifugal Belt Driven Stock Pump 10" Inlet, 6" Outlet
1—Pennsylvania Centrifugal Belt Drive Condensate Pump, 4" Inlet, 2½" Outlet
1—Goulds Triplex Belt Driven Stock Pump, 6" Inlet, 6" Outlet, Piston 8" x 10"
1—Sandy Hill Centrifugal Belt Driven Water Pump, 8" Inlet, 5" Outlet
1—Sandy Hill Centrifugal Belt Driven Water Pump, 8" Inlet, 6" Outlet
1—Goulds Centrifugal Belt Driven Water Pump, 6" Inlet, 6" Outlet

Address Box 48-577 care Paper Trade Journal S-16

1—74" Norwood Seven Roll Stack of Super Calenders. Complete with DC motor equipment.
1—82" Kidder Model SH Shear Cut Slitter and Rewinder.
1—Brand new 62" Johnstone Score Cut Slitter and Rewinder with new motor equipment. For immediate delivery.
1—Hudson-Sharp Co. "C" fold Towel Machine, for double towels 11x13".
1—94" Moore & White Duplex Rotary Sheeter.
Power Paper Cutters: 1—44" White; 4—Oswego, 50", 44", 38" and 34"; 1—32" and 1—42" Acme. 1—57" Seybold Dayton; 1—68" Oswego Heavy Duty.
4—Glassine Bag Machines. Range 3x10" to 12x18".
1—#2 Appleton Jordan—¾" bronze filling—direct connected to 150 h.p.—a.c.—450 r.p.m., 440 volt—3 phase—60 cycle Westinghouse synchronous motor.
2—New type Dilts Beaters, keyed bandless rolls, 60" x 60". Iron sides for concrete bottoms.
2—#2 Emerson Jordans. Shell fillings, 7/16" steel. Plug fillings, 7/16" steel. Direct connected to 50 HP, AC Westinghouse motors.
1—Erie Layboy, size 85" x 45".
1—81" Single Hamblet rotary sheet cutter with slitting attachment.
1—Electric power Elevating Platform Tiering machine.
1—92"Dillon Duplex Sheet Cutter, with Brannan Ream Folder and 24 roll double deck backstands. For tissue.
1—Noble & Wood Pony Jordan, 3/16" plug and shell fillings.
1—42" Type 6-1-A Cameron Slitter and Rewinder, complete with 20 sets of cutters.
2—81" Dietz Perforators, sheets 4½x4½ and 4½x5". Paper Towels 7½x13½".
1—96" board machine, complete with auxiliary equipment.
1—Garment Bag Machine, Bag range 6" to 25" wide by 30" to 60" long.
1—82" Langston Heavy Duty Slitter and Rewinder.
1—42" Type 40 2-A Camachine. Ideal slitter for box makers and label work, etc. Equipped with ten slitter units.
2—48" Inman Board Slitters and Rewinders. Will rewind to 48" diameter.
1—#4 Nash Hytor Vacuum Pump.
1—130" Kidder Slitter and Rewinder. Model STM.
1—42" Kidder Model SL, Shear Cut, Slitter and Rewinder. A-1 condition.
1—60" Clark-Aiken Rotary Sheeter, with slitting attachment and 3 sets of slitters.
1—36" Double Shaft rewind, shear cut Langston slitter and rewinder.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y. TF

FOR SALE

One of the oldest and best equipped paper mills in the East. Operating full time.

Valuable water rights both power and spring water.

Generates all own power largely hydro-electric.

Up to date equipment, including de-inking process.

Main line B & A R.R.
Siding for 20 cars.
Located in small town.
Excellent labor.

COLLINS MANUFACTURING CO.
NORTH WILBRAHAM, MASS.
S-9

WESTERN MASSACHUSETTS
Paper Mill Available

2 complete 84" Fourdrinier machines, trimming 72". Daily capacity 40,000 lb., basis 17x22—20/500.

Large modern filtration plant—150,000 gallons per hour.

Entire plant—225,000 sq. ft.

Sprinklers	Steam Plant
Elevators	Water Power
R.R. Siding	Own Electricity

Terms to be arranged.

Write Box 48-566 care Paper Trade Journal. S-23

FOR SALE

Paper Power Cutters; Slitters & Rewinders; Die Cutters; Printers; Scorers & Creasers; Gluers & Wrappers; Coaters; Laminators; Waxers; Stitchers; Brightwoods.

Write for latest bulletin listing available paper box & paper converting machinery. Get on our permanent mailing list for up-to-date inventory.

SOUTH WABASH ENGINEERING CO.
2929 So. Wabash Ave.
Chicago 16, Ill.
TF

FOR SALE

1—106" Cameron Slitter and Rewinder—Type 18—110" Drums—New machine (never use)—Suitable for 2500 f.p.m. on paper and 1800 f.p.m. on board—Rewind capacity 60" diameter.

J. J. ROSS COMPANY
250 Frelinghuysen Avenue
Newark 5, New Jersey
Bigelow 3-3720 S-9

FOR SALE

2 brand new 10" napkin folders completely equipped.

Address Box No. 48-414
care Paper Trade Journal
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FOR SALE: 34" Camachine #6, rebuilt like new; 45" Finley Sheeter; 14 x 22 John Thomson; 29 x 41 Miehle 2 rev. Cyl. Cutter & Creaser; NEW 36" National Hydraulic & 44" Automatic Power Cutters; New Balers, both hand and power.

Thomas W. Hall Co.
120 West 42nd St., New York 18
TF

FOR SALE—New Beck Sheeter 55" with Layboy never used, in original crate. Paper and Board 62" Laminator and Paster now in operation. Address Box 48-530 care Paper Trade Journal. S-9

FOR SALE

1—Brand new 84" Shartle Brothers Miami low type Waxing Machine, with water tower for cold water finish and also refrigeration or both.
Complete electric drive.
Speed 1200' per minute.
Last word in waxing equipment.
Immediate delivery.
Address Box 48-586
care Paper Trade Journal S-9

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ROSS PAPER MACHINERY COMPANY

265 PASSAIC STREET NEWARK 4, N. J.

CONVERTING PAPER MAKING EQUIPMENT NEW, USED, REBUILT PAPER AND PULP MACHINERY

FOR SALE

4 Fourdrinier Machines Mill complete and running, with Buildings, Boiler Room, Machine Shop, Finishing Room, Railroad Siding, Good Water, 45 Acres of Land. In operation and producing Book, Bristol, Drawing, Egg Shell Book, Envelope, Lining, Lithograph, Mimeograph, Music Offset and Specialties. Capacity 60 tons per 24 hrs.

FOURDRINIER MACHINES

1 Moore & White 100" trim, wire 109" x 50', with suction couch, 24 dryers 36" diameter, size press, 2 nine roll calender stacks, 1 two drum winder, with 3A Bird screen, Jones hi-speed ball bearing Jordan, beaters, spare felts, wires and all spare parts.

1 Moore & White 88" trim, wire 96" x 60', with suction couch, 23 dryers 36" diameter, size press, 1 calender stack, 1 two drum winder with Bird screen, Jones hi-speed ball bearing Jordan, beaters, spare felts, wires and all spare parts.

1 Pusey & Jones 88" trim, wire 96" x 40', with suction couch, 22 dryers 36" diameter, size press, 1 calender stack, 2 two drum winders, one reel, with Bird screen, Jones hi-speed ball bearing Jordan, beaters, spare felts, wires and all spare parts.

1 Pusey & Jones 76" trim, wire 85½" x 55', with suction couch, 26 dryers 36" diameter, size press, 2 calender stacks, 1 Pope reel and 1 winder with Bird Screen, Jones hi-speed ball bearing Jordan, beaters, spare wires and all spare parts.

All of the above machines complete with all drives, pumps, piping.

FINISHING ROOM

4 Hamblet Sheeters 82", 90", 98", 100", with Moore & White four pile layboys and four roll backstands.

1 74" Oswego Trimmer

1 63" Smith & Winchester Undercut Trimmer

1 60" Seybold Precision Trimmer-used two months

1 Morrow-Stevens Type 10 Sealing Machine-used two months

WILL SELL ENTIRE PLANT AT A VERY REASONABLE PRICE OR WILL DISMANTLE AND SELL ANY OF THE PAPER MACHINES OR ANY OF THE FINISHING ROOM EQUIPMENT.

All of the Above for Immediate Delivery.

AMERICA'S LARGEST PURCHASERS OF PAPER MAKING MACHINERY

BARGAINS — FOR SALE

Motor Generator Sets—250 V.D.C. 220/440/2200 V. A.C.—3ph. 60 cy.

No.	KW	Make	RPM.
1	250	West	1200
2 NEW	100	Delco	1200
1	100	Elliott	1200
1	100	G.E.	900
1 NEW	100	Elliott	900
1	100	West	600
1	100	West	700
1	100	Reliance	580
2	90	West.	680
1	75	Elec. Machy.	720
1	75	West.	720
1	75	G.E.	720
2	50	West	490
1	50	Cr. Wh.	900
3	40	G.E.	900
2	30	West.	900
1	30	West.	1750
3	10	West.	1750
1	5	G.E.	1750

VARIABLE SPEED MOTORS—230 V.D.C.

No.	HP.	Make	type	rpm.
2	200	Reliance	1970 T.	400/1200
1	200	West.	SK	400/1200
8	100	Reliance	1050T	400/1000
1	100	G.E.	RC-58	650/1200
2	100	West.	SK-183	575/1150
3	50	West.	SK-180	320/960
3	50	West.	SK	300/1200
1	40	Allis. Chal.		400/1200
2	30	G.E.	DLC	400/1200
1	30	West.	SK-130	725/1450
1	30	G.E.	RA-32	800/1200
1	25	West.	SK-123	400/1600
1	25	West.	SK	500/1500
2 new	25	West.	SK-113	600/1200
1	20	West.	SK-110L	400/1600
1	20	West.	SK-123	400/1600

SLIP RING MOTORS—3ph. 60 cy.

No.	HP.	Make	RPM	Volts
2	800	West.	514	2200/6600
1	250	Allis Chal.	980	2200
1 new	200	G.E.	600	440
1	200	West.	1800	220/440
1	150	West.	1150	220/440/2200
1	100	Triumph	580	550/440/220
1	75	G.E.	720	220/440
1	75	G.E.	885	220/440
1	60	G.E.	720	220/440

A.C. MOTORS—3 ph. 60 cy.

No.	HP.	Make	Type	rpm	volts
1 new	500	Elec. Mach.	Syn	120	4000/2200 220/440
1	200	West.	CS	900	220/44
3 new	200	Elec. Mach.		1800	440
1	150	West.	Syn.	450	220/440
1	150	West.	Syn.	600	220/440
1	150	West.	Syn.	900	220/440
2 new	150	Delco	Syn.	1200	220/440
4	150	Louis Al.		1800	220/440
1	125	Elec. Mach.	Syn.	164	220/440
1	125	West.	CS	680	2200/220/440
2	125	Reliance		600	220/440
1	125	West.	CS	580	2200/220/440
1	100	Reliance		495	220/440
1	100	West.	CS	500	2200
3	100	Elec. Mach.	Syn.	720	220/440
1	100	Allis Chal.		1200	220/440
5	100	Master	TEFC	1750	220/440
1	100	West.	CS	1750	220/440
2	85	Reliance		450	220/440
1	75	Stanley		600	220/440
1	75	Elec. Mach.	Syn.	900	220/440
1	60	G.E.	KT	1800	550/440/220
1	50	Wagner	(Fynn Weichel)	900	440/220
1	50	American		860	220/440
2	50	G.E.	K-405	1800	220/440

A.C. GENERATORS—3 ph. 60 cy.

1—450 kva. Elec. Mach. 120 rpm., 4000/2200/220/440 v.
2—NEW 125 kva. Delco, 1200 rpm., 220/440 v.
2—115 kva. Elec. Mach. 720 rpm., 220/440 v.
1—100 kw. Elec. Mach. 164 rpm., 220/440 v.
1—100 kw., West. 900 rpm., 2200/220/440 v.
1—100 kw. West. 600 rpm., 220/440 v.
4— 25 kw. O'Nan, 1800 rpm., 220/440 v.

D.C. GENERATORS—250 V.D.C.

3—250 kw., Westinghouse 1200 rpm.,
2—200 kw., Reliance, 500 rpm.,
8—100 kw., Reliance, 500 rpm.,
1—100 kw., West., 720 rpm.,
7—100 kw., Delco, 1200 rpm.,
1—new 100 kw., Elliott 1200 rpm.

SAVE OVER 50% on NEW BLOWERS & VENTILATING FANS AXIAL FLOW VENT. FANS

1—4000 cfm 3" stat. pres. Sturtevant with 4/1.2 hp., 1750/1150 rpm. 220/3/60 motor.
2—4000 cfm 3" stat. pres. Sturtevant 2 speed AC Motors.
2—5000 cfm. 1.8 stat. pres. Sturtevant 220/440 v. AC Motors.
31—6000 cfm. Sturtevant Bul. No. 512389, 3" stat.
6—1600 cfm. Buffalo 3" stat. pres. 1800/1200 rpm., 220-440 V. AC West. TEFC Motors.
2—6000 cfm. Sturtevant 1.65" stat. pres. 220/440 V. AC. Motors.
1—7500 cfm. Clarage 7½ hp., 220/440 V 2 speed motor.
2—12000 cfm. 3" stat. pres. Sturtevant with dir. con. 10/3 HP. 1775/1180 rpm., 220/440 V. TEFC motors.
6—16000 cfm. Buffalo 3" stat. pres. 1800/1200 rpm., 15/4.5 HP. 220/440 V. totally enclosed AC Motors.
5—30" dia. 72½" long, 2 sets of propellers, 8 blades to ea. propeller 14"x9½" mfg. by Int. Eng. Co., size 114, driven by 100 HP., 1750 rpm. 220 or 440 V. AC Motors.

115 VOLT D.C.

8—4000 cfm. Sturtevant, 3" stat. pres. West SK motors.
4—4000 cfm. American Blower 3" stat. pres. 4/1.7 HP. Motors.
1—3000 cfm. Sturtevant 3" stat. pres. 3/1.25 HP. Motor.

SURFACE COMBUSTION GARDEN CITY HEAT TYPE EXHAUSTERS

3—No. 55 Single SSP, 14060 cfm. at 1202 rpm., S.P. at 70 deg. F and 8" water for 1200 deg. F. operation.
2—No. 50 Single SSP, 10000 cfm. at 1375 rpm., SP. at 70 deg. F and 8" water for 1200 deg. F. operation.

BRAND NEW SYNCHRONOUS MOTOR

500 HP., Elec. Machy. Co., 2200/220/440 v. 3 ph. 60 cy. 120 rpm.

100 KW. DIESEL ENGINE GENERATOR SETS

11—100 KW., 120/240 V. D.C. Delco Generators dir. con. to 150 HP., Model GBD-8, 5½x7, 8 cyl. Superior Diesel Engines, elec. starting with muffler, power panel and accessories, Practically as good as new—Only Used for Spares.

AIR COMPRESSORS—SPECIAL BARGAIN

6—240 cfm. Westinghouse type 3 VS-23, 3 cyl. vert., 150 lb. pres. dir. con. to 50 HP., 220/440 or 2200 v. 3 ph. 60 cy. West. Slip Ring Motors with automatic control. Can furnish D.C. Motors or Oil or Gasoline Engines if desired.
1—315 cfm. Ingersoll Rand Portable, 100 lbs. pres. driven by Waukesha Oil Engine 860 rpm.

"Write for Stocklist"

DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH (6), PA.

Montrose — 5800

FOR SALE

BEATERS
4—67 x 69 Valley
1—58 x 48 Dilts high speed, iron tub
2—62 x 42 Davingtown, iron tub
1—48 x 44 MidWest high speed, iron tub
3—46 x 44 Dayton, iron tub
1—84 x 18 Dilts, stone roll
1—Shartle broke beater, roll 84 x 84"
CALENDERS
1—106" seven roll machine
1—78" nine roll machine
1—58" nine roll Holyoke supercalender, Timken bearings
1—62" seven roll Textile supercalender
CUTTERS (REAM)
1—74" Oswego
3—64" Seybold
1—50" Oswego
1—48" Acme
CUTTERS (SHEET)
1—80"—84"—88" Moore and White
1—64"—72"—65" Clark
1—48" Finlay
DRYERS
34—48 x 128" with bearings
2—96 x 174"
15—42" x 120" anti friction bearings
5—80 x 174"
1—42 x 120"
9—48 x 104" with frames and bearings
PRESS PARTS
3—Goto Horne, rolls 20 x 120"
Three sets Rice Barton, rolls 18" x 116"
Three sets Rice Barton, rolls 20" x 104"
FOURDRINIER PARTS
1—133" Pusey and Jones, wire 61 feet
1—106"
MOULDS
1—36 x 125"
1—36 x 86"
1—36 x 106"
JORDANS
1—Claflin #1
1—Wiener Refiner very good
1—Horne
1—Emerson #2, anti friction
AUTOMATIC SORTING MACHINES
3—74" wide with capacity of 2½ reams per hour
1—80" wide, capacity 4 reams per hour
PAPER MACHINES
1—100" trim Fourdrinier paper machine, 3 screens, Voith inlet Fourdrinier wire 121" x 61' 5½". 45 table rolls, 6 suction boxes, 23" suction couch, 3 presses, 18" suction on 1st press, 20" dia. rolls, smoothing press. Dryer section consists of 21 60" x 110" and 4 felt dryers. Top and bottom felt. 2 Calenders, one 8 roll and one 10 roll, 114" face, reel and winder. Spiral bevel gear drive. Auxiliary equipment and spare parts.
1—80" Paper Machine, rotary screen, Fourdrinier, two sets presses, 7 dryers 36 x 92". Five roll calender, winder and drive. Auxiliary equipment and motor, used on tissue. All set up in good running condition.
SCREENS
1—#3 Bird
1—Jones Leithwaik
1—Moore and White
4—12 plate Packer
1—12 plate Dunbar
PUMPS (STUFF)
2—12 x 12 Gould triplex
1—10 x 20 Shartle duplex
1—7 x 10 Gould triplex
1—8 x 10 Gould triplex
PUMPS (VACUUM)
1—14 x 20 Cannersville
1—16 x 24 Cannersville
FILTERS
1—8 x 12 Oliver
1—8 x 6" Vacuum
SLITTERS
1—60" Langston
1—66" #6 Cameron
1—52" #3 Cameron
1—130" Pusey and Jones two drum
1—150" Warren, two drum
1—82" Moore and White two drum
1—84" Moore and White four drum
GRINDERS
6—Four pocket grinders

Frank H. Davis Co., 175 Richdale Avenue, Cambridge, Massachusetts TF

PAPER COATING MACHINERY—Waxing, Oiling, Carbon, Laboratory Coating and Treating Machines. New improvement. MAYER MACHINE COMPANY, Inc., 1313 Buffalo Road, Rochester, 11, N. Y. TF

FOR SALE—One Schopper-Riegler Fold Tester. Address Carew Manufacturing Co., South Hadley, Mass. S-16

FOR SALE—One 12' x 186" Yankee Dryer, available for immediate shipment. FRANK H. DAVIS COMPANY, 175 Richdale Ave., Cambridge, Mass. S-23

FOR SALE—28 x 44 Sheridan Model 8-D four rod Embosser. Located Middle West. Being replaced by new but in A-1 working condition. Address Box 48-570 care Paper Trade Journal. S-9

FOR SALE—40" National Ream Cutter, new in 1939, serial number 1699, with motor. FRANK H. DAVIS CO., 175 Richdale Avenue, Cambridge, Mass. S-30

DOCTOR RODS—For wax, carbon, glueing, oiling and asphalt machines. Any size wire precision wound on 1/32, 1/16 or 3/32 diameter rods. DE NEVE and CONSLER CO., P. O. Box 817, Rochester, 3, N. Y. S-9

WANTED

WANTED

Small tonnage of bleached, white, absorbent Kraft, .007", wet-strength; in rolls 30" or 40" wide; continuous business. Address Box 48-571, care Paper Trade Journal. S-16

WANTED

WANTED
Slitter—Slotter

Four-Bar Complete with Slotters and Slitter Knives.

From 72" to 102" Width. With or Without 220 V—3 Ph. 60 Cyl. Electric Motor.

Address Box 48-584, care Paper Trade Journal. S-9

PAPER MANUFACTURER desires to purchase or invest in converting business of standard paper products. Address Box 48-222 care Paper Trade Journal. TF

WANTED—Brightwood Box Machine. Address Box 48-224 care Paper Trade Journal. TF

WANTED—W & P Shredders, Evaporators Generators and Boilers, Slitters, Cutters. Hydraulic Presses, Sheridan Presses, Dryers. Address Box 48-223 care Paper Trade Journal. TF

WANTED — Canadian Standard or Green Freeness Tester. Will buy or accept in exchange for practically new Schopper-Riegler Freeness Tester. Address TEXON, INC., Huntington, Mass. S-16

WANTED—One Ingersoll Glarimeter, new or used. Address Box 48-578 care Paper Trade Journal. S-23

WANTED

ADDITIONAL LINES WANTED—Manufacturers' representative (established 1935 in Chicago, handling Mill and Factory Supplies, small Machinery and Alloy Tools) has resumed operations and will give regular coverage to the leading industrial points in northeastern Wisconsin from headquarters in Green Bay. Inquiries from manufacturers of paper mill and dairy industry supplies and equipment desiring effective, business like representation in this important distributing area are invited. LOCKWIN & COMPANY, Box 114, GREEN BAY, WIS. S-9

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TISSUE MILL—Have mill with water power. Need partner to help finance and operate mill. Have machinery lined up and market for output. Address Box 48-552 care Paper Trade Journal. S-9

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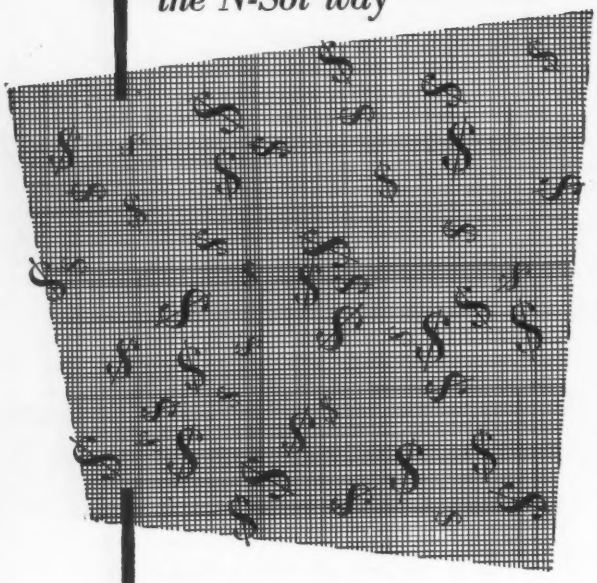
the N-Sol way



more fibre
on the wire

Increased fibre and filler held in the wet web formation reduces losses in the white water. Solids content of the white water coming from the machine when N-Sol has been used may be cut by approximately 50%.

You see the difference when you add N-Sol (activated silica sol) on the machine side of the jordans. There's an increase in weight of the sheet and a reduction in the two-sidedness of the sheet.

N-Sol is economical, too. Made conveniently in your mill by reacting "N" Silicate of Soda with a suitable reagent. The cost is slightly better than half that of ordinary glue.

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Nopco Chemical Co.
Norton Co.
Raybestos-Manhattan Inc., Manhattan Rubber Division

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American Anode Incorporated
Arabol Mfg. Co.
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Philadelphia Quartz Co.

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Morden Machines Co.
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Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

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The Cincinnati Rubber Mfg. Co.
The Goodyear Tire & Rubber Company
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Raybestos-Manhattan Inc., Manhattan Rubber Division
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Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
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Hercules Powder Co., Inc.

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Philadelphia Quartz Co.
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Reichhold Chemicals, Inc.
Rohm & Haas Co.
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Hardinge Company, Inc.
Hudson Sharp Machine Co.
Rodney Hunt Machine Co.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
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Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
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Main, Inc., Chas. T.
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Shartle Brothers Mch. Co.

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CORES
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Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
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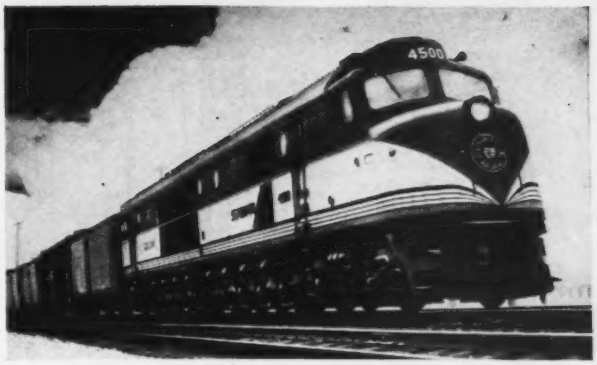
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg Co.
Taylor Stiles & Co.



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SEABOARD'S modern freight and passenger facilities serve the industries situated along its busy rails, through the States of Virginia, North Carolina, South Carolina, Alabama, Georgia and Florida.

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A letter outlining your expanding industrial requirements will bring you detailed facts from Seaboard's files concerning one or more of these sites particularly suitable to your needs. Please address:

Dallas T. Daily, General Industrial Agent
Seaboard Air Line Railroad Company
Norfolk 10, Va.

SEABOARD
AIR LINE RAILROAD COMPANY
THROUGH THE HEART OF THE SOUTH

The Mill that uses Butterworth Rolls

It all began with one test roll in the Calender Stack. This single Butterworth Calender Roll outlasted all other rolls in the stack, giving many extra hours of service without requiring turning down or refilling. Led the mill to standardize on Butterworth Calender Rolls. Butterworth Rolls produce exactly the desired finish because they are made to specification and tested before delivery. As many as 30 test readings are made before a roll is pronounced satisfactory. Remember, the finish on the paper can only be as good as the rolls in the calender. Butterworth Calender Rolls are furnished new or refilled for any make calender. Write us today.

For full information, write or call H. W. Butterworth & Sons Company, Philadelphia 25, Penna. — Providence Division, Providence, R. I. : : Charlotte, N. C., 1211 Johnston Building In Canada—W. J. Westaway Company, Hamilton, Ontario

Butterworth Calender Rolls

TO BUY

CYLINDERS
Cheney Bigelow Wire Works

DAMPENERS
Perkins & Son, Inc., B. F.
Raybestos-Manhattan Inc., Manhattan Rubber Division
Valley Iron Works Co.

DANDY ROLLS
Cheney Bigelow Wire Works

DEASPHALTING CHEMICALS
Adell Chemical Company

DECKLE STRAPS
Stowe Woodward, Inc.

DECKLE WEBBING
Williams-Gray Co.

DE-INKING
Adell Chemical Company
Buffalo Electro-Chemical Co., Inc.
Dilts Machine Works
General Dyestuff Corp.
Kinsley Chemical Co.
Roderick O'Donoghue
Shartle Brothers Machine Co.

DEINKING CHEMICALS
Adell Chemical Company
General Dyestuff Corp.
Kinsley Chemical Co.
Monsanto Chemical Company
Philadelphia Quartz Co.

DENSOMETERS
W. & L. E. Gurley

DESIGN CONSTRUCTION
Ebasco Services

DETERGENTS
Adell Chemical Company
Calgon, Inc.
Cowles Detergent Co.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Philadelphia Quartz Co.
Rohm & Haas Co.

DEWAXING CHEMICALS
Adell Chemical Company
General Dyestuff Corp.
Nopco Chemical Co.

DIGESTERS
Babcock & Wilcox Co.
The Biggs Boiler Works Co.
Combustion Engrg. Co., Inc.
Foster Wheeler Corp.
General American Trans. Corp.
Lukenweld
Pusey & Jones Corp.

DISPERSING AGENTS
Adell Chemical Company
Calgon, Inc.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Lodding Engineering Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
Lodding Engrg. Corp.
Raybestos-Manhattan Inc., Manhattan Rubber Division
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DRIERS
Black-Clawson Company
Gibbs-Brower Company, Inc.
Hardinge Company, Inc.
Lukenweld
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
The Youngstown Welding & Engrg. Co.

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
Dilts Machine Works
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Farrel-Birmingham Co.
General Electric Company
Gibbs-Brower Company, Inc.
Rodney Hunt Machine Co.
Link Belt Company
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
T. B. Wood's Sons Co.
Westinghouse Electric Corp.

DRYER DRAINAGE
Stickle Steam Specialties Co.

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
John Waldron Corp.

DYESTUFFS
American Cyanamid Company, Calco Chemical Div.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuffs Corp.
National Aniline Division, Allied Chemical & Dye Corp.
C. K. Williams & Co.
Witco Chemical Co.

EMBOSSING ROLLS
The Appleton Machine Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
The Midvale Company
Northern Engraving & Mch. Co.
B. F. Perkins & Son, Inc.
John Waldron Corp.

EMULSIFIERS
Adell Chemical Company
General Dyestuff Corp.
Nopco Chemical Co.
Rohm & Haas Co.

ENZYMES
Rohm & Haas Co.

EVAPORATORS
Foster Wheeler Corp.
General American Transportation Corp.
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

EXPANDERS
Mount Hope Machinery Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Hardinge Company, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Wallace & Tiernan

WHERE

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bulkley, Dunton Pulp Co., Inc.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
Williams-Gray Co.

FELT CLEANERS
Adell Chemical Company
Calgon, Inc.
The Cowles Detergent Company
General Dyestuff Corp.
Nopco Chemical Co.

FELT GUIDES
Black-Clawson Co.
Frank W. Egan & Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Cyanamid Company, Industrial Chemicals Division
Johns-Manville Sales Corp.
W. H. Loomis Talc Corp.
A. M. Meincke & Son, Inc.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
R. P. Adams Co., Inc.
Cochrane Corp.
General American Transportation Corp.
Hardinge Company, Inc.
Moore & White Co.
J. O. Ross Engrg. Corp.
Witco Chemical Co.
Walworth Company

FITTINGS
Crane Company
Ladish Company
Phoenix Products Co.
Walworth Company

FLOORING, GRATING AND TREADS
The Goodyear Tire & Rubber Company
Norton Co.
Raybestos-Manhattan Inc., Manhattan Rubber Division

FLOW BOXES, STAINLESS-CLAD
Lukens Steel Co.

FORMING MACHINES
Black-Clawson Co.
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters, Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FRICTION MATERIALS
Johns-Manville Sales Corp.
Raybestos-Manhattan Inc., Manhattan Rubber Division

FREENESS TESTERS
Testing Machines, Inc.

GASKETS
The Goodyear Tire & Rubber Company
Raybestos-Manhattan Inc., Manhattan Rubber Division

GEARS
Black-Clawson Company
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Suburban Machine Co.
Valley Iron Works Co.
Waldron Corp., John
Westinghouse Electric Corp.

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Norton Company

GUIDES, WEB
Mount Hope Machinery Co.
Bound Brook Engrg. Co.

GUMS
National Starch Products Inc.
Stein-Hall Co., Inc.

HEADS
Babcock & Wilcox Co.
Lukens Steel Company

HEAT EXCHANGERS AND RECOVERY SYSTEMS
William Allen Son's Company
Foster Wheeler Corp.
Stickle Steam Specialties Co.
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Cochrane Corp.
E. D. Jones & Sons Co.
General Electric Co.
Leeds & Northrup
Minneapolis-Honeywell Regulator Co.
D. J. Murray Mfg. Co.
Ross Engineering Corp., J. O.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

HOISTS
Appleton Machine Co.
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Goodyear Tire & Rubber Company
Raybestos-Manhattan Inc., Manhattan Rubber Division

IMPREGNANTS
American Anode Div., The B. F. Goodrich Chem. Co.

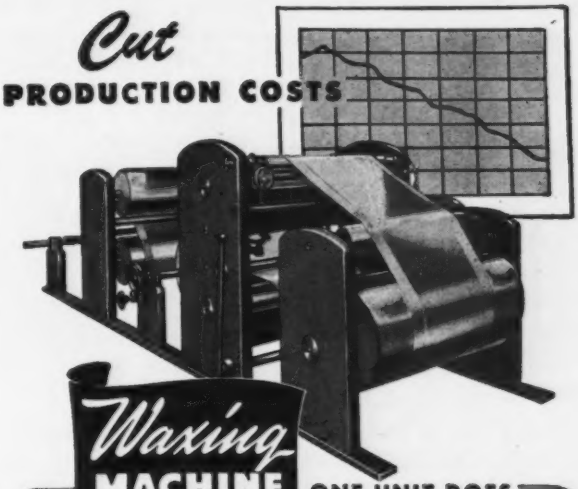
INDUSTRIAL TRACTORS
Clark Equipt. Co., Clark Tructractor Div.
Towmotor Corp.

INSTRUMENTS, TESTING AND MEASURING
Bauer Brothers Co.
N. P. Bewsher
The Bristol Company
The Brown Instrument Co.
Cady & Co., E. J.
Cochrane Corp.
The Foxboro Company
General Electric Company
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taylor Instrument Cos.
Testing Machines, Inc.
Wallace & Tiernan Instrument Co.
Williams Apparatus Co., Inc.

JOINTS
Perfecting Service Corp.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.

Cut
PRODUCTION COSTS

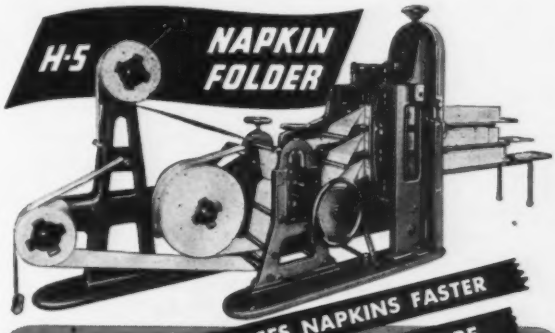


Waxing
MACHINE

ONE UNIT DOES MULTIPLE JOBS

The demand for waxed papers is greater than ever before — despite raw paper shortages. There is a Hudson-Sharp waxer designed for any one of the many wax processes. No. AW-3, illustrated, is our wax coater — for single or double facing.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

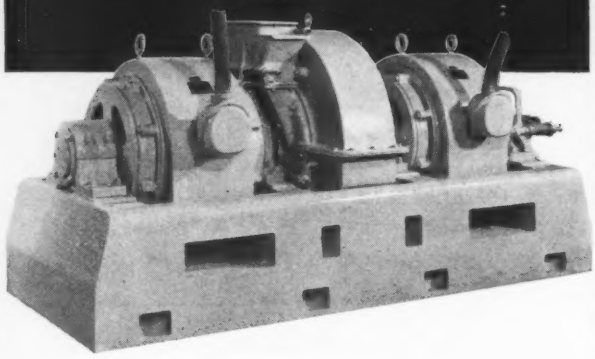


PRODUCES NAPKINS FASTER . . . THAN EVER BEFORE

MORE and better napkins with our post-war No. 2-A folder. Makes all folds — quarter fold, eighth fold, sixteenth fold and dispenser fold — on one machine. This unusual versatility, plus our usual quality, makes this multiple duty folder an important addition to your production department. Write for information.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

HARD WOODS AND SOFT TURNED INTO A-1 PULP WHEN BAUER-FIBERIZED



MILLS PROCESSING hardwood sulphite in lieu of spruce sulphite are installing Bauer pulpers —and with notable results.

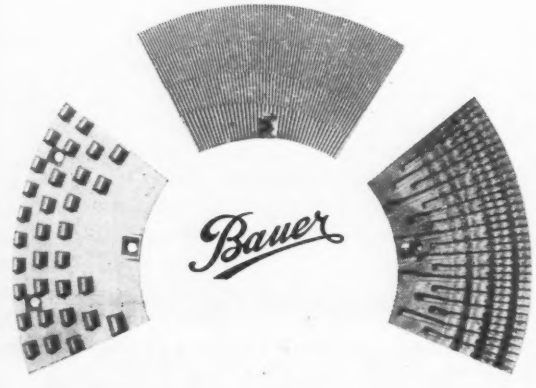
Hardwood sources, heretofore neglected, now being tapped. Organic dirt dispersal up to 90%, resulting in far greater cleanliness.

Excellent formation and a noticeable increase in strength are being obtained at a high freeness level.

The above listed benefits are impressive, especially at mills with plenty of hardwood available. Savings of several dollars per ton of furnish are actually being realized.

BAUER PULPERS also standard equipment for pulping of screenings and rejects.

THE **BAUER BROS.** CO.
SPRINGFIELD, OHIO



TO BUY

Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
Heppenstall Company
E. D. Jones & Sons Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOT BORING MACHINES
DeZurik Shower Company

LABORATORY EQUIPMENT
William Allen Son's Company
Appleton Machine Co.
Bauer Brothers Co.
The Biggs Boiler Works Co.
Dilts Machine Works
W. & L. E. Gurley
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works Co.

LAY BOYS
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.
Suburban Machine Co.

LINTER COTTON
The Railway Supply & Mfg. Co.

LUBRICANTS
Gulf Oil Corporation
Sinclair Refining Co.
Socony-Vacuum Oil Co.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

MATERIALS HANDLING
Cleveland Crane & Engrg. Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Co.
Testing Machines, Inc.
Walker-Goulard-Plehn Co.

MIXING BOXES
Cheney Bigelow Wire Works

MOISTURE CONTENT CONTROL
Stickle Steam Specialties Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
Fairbanks, Morse & Co.
General Electric Company
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.

MOULDS
Cheney Bigelow Wire Works

NICKEL and NICKEL ALLOYS
The International Nickel Co.

NOZZLES
Link Belt Company

PACKING BOXES
Johnson Corporation
Perfecting Service Corp.
Shartle Brothers Machine Co.

PACKING
Johns-Manville Sales Corp.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan Inc.

PAINT
American Marietta Co., Valdura Division

PAPER MACHINES
Bagley & Sewall Co.
Black-Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc
Thomas W. Hall Co.
Lukenweld
Moore & White Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.
Suburban Machine Co.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Dilts Machine Wks.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PENSTOCKS
The Biggs Boiler Works Co.

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.

PIPE
American Cast Iron Pipe Co.
Armco Drainage & Metal Products, Inc.
Babcock & Wilcox Co.
Crane Company
Johns-Manville Sales Corp.
Ladish Company
Michigan Steel Casting Co.
Stowe-Woodward, Inc.
Walworth Company
Youngstown Welding & Engrg. Co.

PIPE FITTINGS
American Cast Iron Pipe Co.
The American Rolling Mill Co.
Crane Company
Ladish Company
Michigan Steel Casting Co.
Phoenix Products Co.
Walworth Co.

PITCH CONTROL
General Dyestuff Corp.
Monsanto Chemical Company
Rohm & Haas Co.

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F.

PLATES
Armco Drainage & Metal Products, Inc.
Babcock & Wilcox Co.
The Biggs Boiler Works Co.
J. O. Ross Engrg. Corp.
Lukenweld
Lukens Steel Company
Timken Roller Bearing Co.

PLUGS
The Appleton Machine Co.
Black-Clawson Company
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

PRECISION SAMPLE CUTTER
Testing Machines, Inc.

PRESERVATIVES
E. I. du Pont de Nemours & Co.
General Dyestuff Corp.

PRESSURE VESSELS, STEEL AND ALLOY
William Allen Son's Company
Babcock & Wilcox Co.
The Biggs Boiler Works Co.
Combustion Engrg. Co., Inc.
General American Transportation Corp.
Foster Wheeler Corp.
The Midvale Company

PRESSES
Black-Clawson Company
Dietz Machine Works

WHERE

Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
Williams Apparatus Co.

PULP CLASSIFIER
The Bauer Bros. Co.

PULP STOCK VALVES
Crane Company
Record Fdy. & Mach. Co.
Shartle Bros. Mach. Co.

PULPERS
Bauer Brothers Co.
Dilts Machine Works
Shartle Brothers Machine Co.

PULPS
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Elof Hansson, Inc.
Lyddon & Co. (America), Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Pulp Sales Corp.

PULPSTONES
Norton Company

PUMPS
Allis-Chalmers Mfg. Co.
American Well Works
Black-Clawson Company
Buffalo Pumps, Inc.
Byron Jackson Co.
Dorr Company
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Frederick Iron & Steel, Inc.
Gibbs-Brower Company, Inc.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Paper Converting Mch. Co.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company

RAG COOKING PROCESSES
Adell Chemical Co.
William Allen Son's Company
The Kinsley Chemical Company
General Dyestuff Corp.
Rohm & Haas Co.

RAG CUTTERS
Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

RECAUSTICIZING PLANTS
General American Transportation Corp.

RECOVERY SYSTEMS
William Allen Son's Company
American Well Works
Babcock & Wilcox Co.
Bulkley, Dunton Pulp Co., Inc.
Combustion Engrg. Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones Corp.
Ross Engineering Corp., J. O
Valley Iron Works Co.

REELS
The Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Hudson Sharp Machine Co.
Moore & White Co.
Paper Converting Mch. Co
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
Gibbs-Brower Company, Inc.
The Hermann Mfg. Co.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
Cochrane Corp.
DeZurik Shower Company
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
Minneapolis-Honeywell Regulator Co.
National Technical Laboratories
Shartle Brothers
Stickle Steam Specialties Co.
Taylor Instrument Companies
Wallace & Tiernan

RESINS
American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Company
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Monsanto Chemical Company
Reichhold Chemicals, Inc.
The Resinous Prod. & Chem. Co.

ROLLS
American Cast Iron Pipe Co.
Appleton Machine Co.
Black-Clawson Company
H. W. Butterworth & Sons Co
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
The Midvale Company
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Raybestos-Manhattan Inc., Manhattan Rubber Division
J. J. Ross Company
Ross Paper Machy. Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Stowe-Woodward, Inc.
Valley Iron Works Co.
Waldron Corp., John
The Youngstown Welding & Engrg. Co.

ROLL COVERS
The Cincinnati Rubber Mfg. Co
The Goodyear Tire & Rubber Company
Raybestos-Manhattan Inc., Manhattan Rubber Division
Stowe-Woodward, Inc.

ROLL STANDS
Cameron Machine Co.
Frank W. Egan & Co.
Moore & White Co.
Potdevin Machine Co.
John Waldron Corp.
H. G. Weber & Co., Inc.

ROOFING MATERIALS
Johns-Manville Sales Corp.

ROTARY BOILERS
The Biggs Boiler Works Co.

ROTARY JOINTS
Perfecting Service Corp.

RUBBER PRODUCTS
The Goodyear Tire & Rubber Company
Raybestos-Manhattan Inc., Manhattan Rubber Division
Stowe-Woodward, Inc.

SATURANTS
American Anode Div., The B. F. Goodrich Chem. Co.

SATURATING MACHINES
Black-Clawson Company
Frank W. Egan & Co.
Gibbs-Prower Company, Inc.
Moore & White Co.
Noble & Wood Machine Co

For Efficiency and Economy

Choose Jenkins'

METKOR

(Trade Mark Reg. Pdg.)

CYLINDER BRUSHES FOR PAPER MAKING

These brushes were designed from a knowledge of paper manufacturers' brush problems acquired in our many years of service to the paper industry.

They replace old type coating and color spraying brushes that warp and get out of alignment, and they last 3 to 12 times longer.

CONSIDER THESE FEATURES —

1) Cores of aluminum or cold drawn steel. They can't sag or split. Are practically indestructible.
2) The bristle wound on the metal cores with flat copper, galvanized, or steel bands is embedded in moisture proof baked plastic cement. Bristle—nylon if desired—is renewable when worn.
3) No crevices where residual coating can lodge, assuring easy, thorough cleaning—especially important where brush is used for colors of different shades.

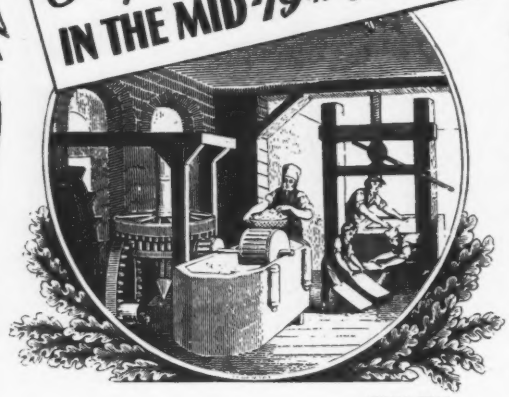
The Jenkins' line of paper mill brushes includes china bristle flat brushes, grey bristle scrubbers, and badger hair finishing brushes for coated stock.

Send for illustrated catalog.

M. W. JENKINS' SONS, INCORPORATED

CEDAR GROVE, ESSEX COUNTY, NEW JERSEY

Paper Making IN THE MID-19th CENTURY



BETTMANN ARCHIVE

Paper making was more of an art than production. The production was limited to the individual effort of the paper maker. From this art grew today's modern production paper mill where tons of paper are produced faster than the early paper maker produced sheets. Then paper was produced sheet by sheet—but even in the early days felts were part of the equipment of the paper maker. Today felts are as important as then, having kept pace with paper making. Since 1890 Appleton felts have met all requirements of paper mill production, year after year.

This advertisement is one of a series depicting early history of paper making.

APPLETON WOOLEN MILLS

APPLETON
WISCONSIN

TO BUY

Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS
Hardinge Company

SCALES
Fairbanks, Morse & Co.
Merrick Scale Mfg. Co.
Testing Machines, Inc.
Walker-Goulard-Plehn Co.

SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
American Well Works
Appleton Wire Works
Appleton Machine Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
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The Sandy Hill Iron & Brass Works
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Bulkley, Dunton Pulp Co., Inc.
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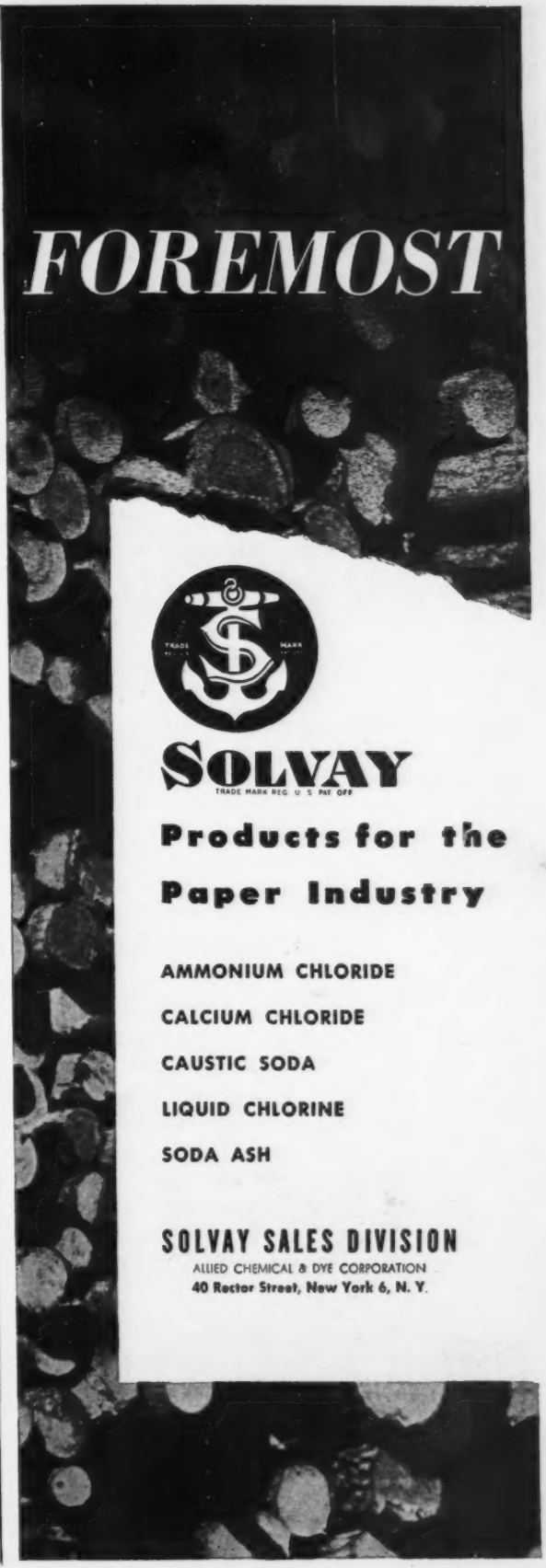

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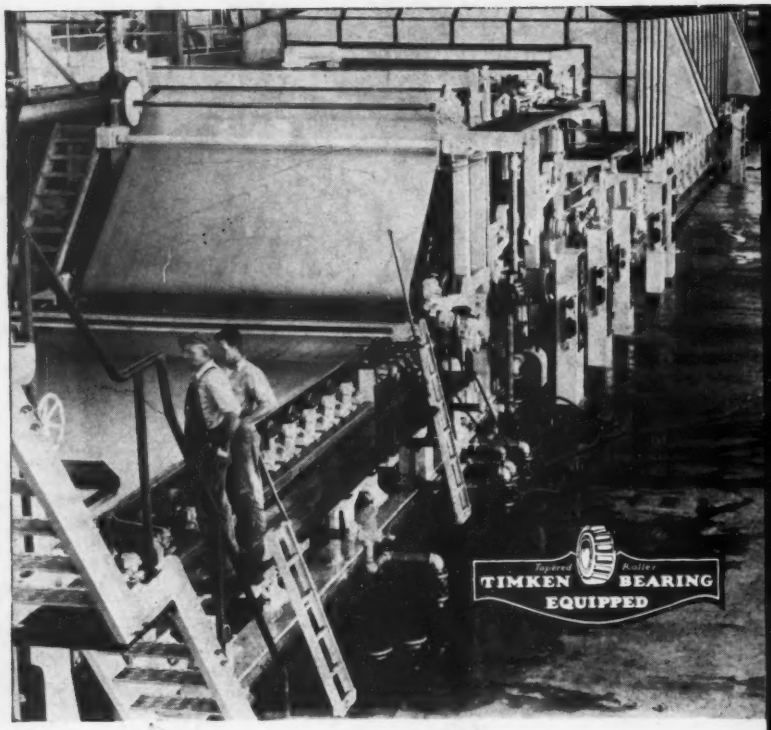

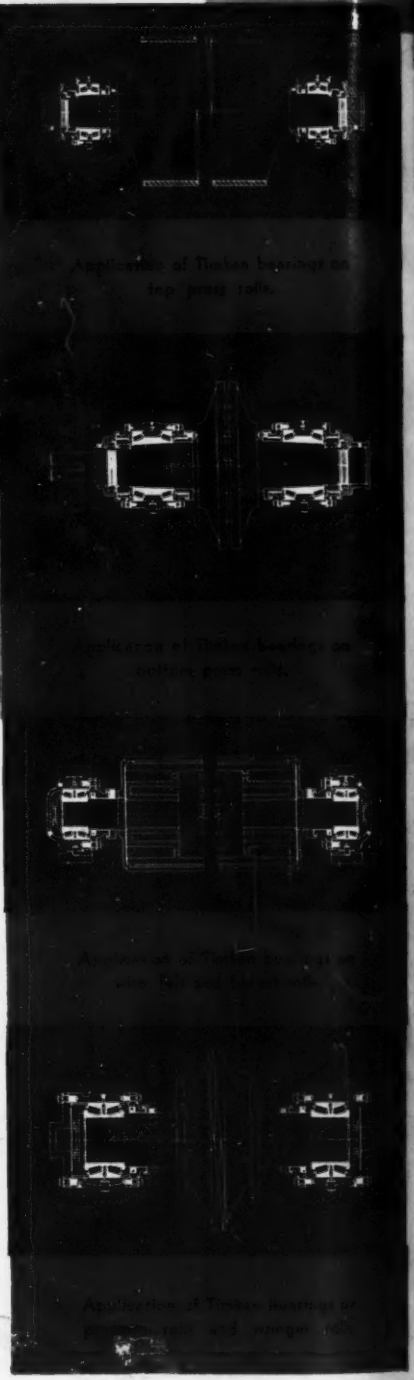

Another New Fourdrinier Machine Goes On TIMKEN® BEARINGS

The photograph shows a new paper machine built by the Black-Clawson Company, Hamilton, Ohio and installed recently at Fernstrom Paper Mills, Inc., Pamona, California for the production of fruit wrap paper.

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hardwood soda pulp. The possible advantages of blending this pulp with other papermaking pulps for the manufacture of several types of fine specialty papers are discussed. The roughly estimated manufactured cost of the straw pulp; based on raw material costs, is within the range of the cost of competitive wood pulps.

It is concluded from these studies that a pulp suitable for fine specialty papers can be prepared economically from wheat straw by the neutral sulphite process.

Acknowledgment

The authors gratefully acknowledge the assistance of L. E. Talley, E. Helman, and J. A. Ashby in carrying out these studies.

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TAPPI Notes

A. H. Nadelman, formerly of the International Paper Company, is now professor of pulp and paper technology, Western Michigan College, Kalamazoo, Mich.

Kenneth D. Running, formerly of the St. John Sulphite, Ltd., is now with the Halifax Paper Company, Roanoke Rapids, N. C.

David R. Kuhe, formerly of Cia. Ind. de Atenquique, is now assistant manager, Crossett Paper Mills, Crossett, Ark.

E. N. Poor, formerly of the American Cyanamid Company, is now with the Kennebec Div., Hudson Pulp and Paper Company, Augusta, Me.

Frederick W. Taylor, formerly of the Augusta Iron Works, is now branch manager, Chain Belt Company, Richmond, Va.

J. E. Tobey, formerly of the Fairmont Coal Bureau, is now president of Appalachian Coals, Inc., Cincinnati, Ohio.

Robert D. Parsons, formerly of the University of Maine, is now with the Hollingsworth & Vose Company, E. Walpole, Mass.

John M. Dyer, formerly of the Fonda Container Company, is now chief engineer, White-Washburne, Inc., Hinsdale, N. H.

Charles W. Cassell, formerly of the Barrett Division, is now technical director, John Strange Paper Company, Menasha, is.

Lewis R. Ayers, formerly of the Institute of Paper Chemistry, is now director of the laboratory, Robert Gair Company, Piermont, N. Y.

Torsten Hasselstrom, formerly of the U. S. Industrial Chemicals, Inc., is now senior organic chemist with the U. S. Quartermaster Research and Development Laboratories, Philadelphia, Pa.

Howard H. Parker of the Paper Makers Chemical Department, Hercules Powder Company, has been transferred from Kalamazoo to Milwaukee, Wis.

Peter B. Borlew, formerly of the Nekoosa-Edwards Paper Company and the Military Government (U.S.) for Germany, is now technical superintendent of the Container Corporation of America, Fernandina, Fla.

Hugo Klein has resigned as vice president for production and research of Converted Rice, Inc., Houston, Texas.

The dinner speaker at the TAPPI Mechanical Pulping Conference, Poland Spring, Maine, will be Robert E. Canfield, Vice President of the Groundwood Paper Manufacturers Association. His topic will be "Groundwood —the Oldest Wood Pulp and the Newest."

The Tappi Pacific Section will meet at Bellingham, Wash., on September 28th. The subject for discussion will be "Power Plant Engineering."

The TAPPI Chicago Section will meet at the Chicago Bar Association, 29 So. La Salle Street, Chicago, at 6:30 p.m., September 20th. W. F. Gillespie of the Gaylord Container Corporation, Bogalusa, La., will give "A Review of the Development of the Paper Industry in the South."